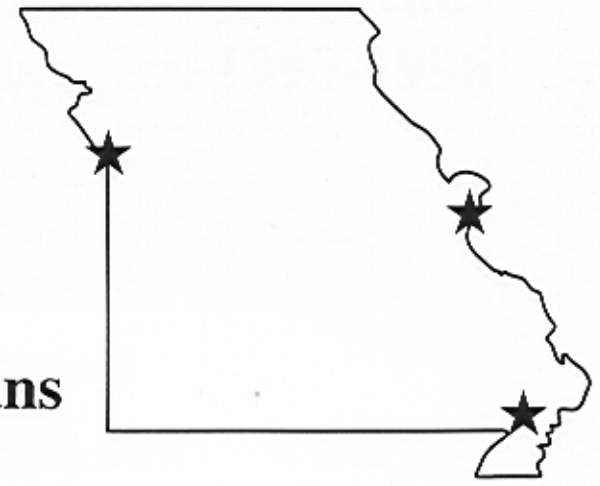
Changes in Modifiable Cardiovascular Disease Risk Factors among African Americans in the City of St. Louis, Kansas City and the Bootheel Region of Missouri, 1990-1996



Office of Surveillance, Research and Evaluation

Missouri Department of Health

Division of Chronic Disease
Prevention and Health Promotion

1999

Maureen E. Dempsey, M.D.
Director
Missouri Department of Health

Bernard R. Malone, M.P.A.
Director
Division of Chronic Disease Prevention & Health Promotion

Eduardo J. Simoes, M.D., M.Sc., M.P.H.
Medical Epidemiologist
Division of Chronic Disease Prevention & Health Promotion

Jeannette Jackson-Thompson, M.S.P.H., Ph.D.
Chief
Office of Surveillance, Research, and Evaluation

Changes in Modifiable Cardiovascular Disease Risk Factors among African Americans in the City of St. Louis, Kansas City and the Bootheel Region of Missouri, 1990-1996

Monograph No. 3

Authors:

Michael Dietz, M.S.
Eduardo Simoes, M.D., M.Sc., M.P.H.
Brian Waterman, M.A.

Contributors:

Jeannette Jackson-Thompson, M.S.P.H., Ph.D.
Edward Kinman, Ph.D.
Patrick Akinbola, Ph.D.
Theo Murayi, Ph.D.
Bernard Malone, M.P.A.

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Nancy Miller, M.Ed.
Joseph Vradenburg, M.A.

Layout and design:
Jim McDonald, M.A.
Mary Beth Deeken, B.S.

Clerical support:
Jamie Strawn
Amy Connell
Malecia El-Amin

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To order a copy of this publication, contact:
Missouri Department of Health
Division of Chronic Disease Prevention and Health Promotion
101 Park DeVille Drive, Suite A
Columbia, MO 65203
(573) 876-3200

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Preface

The Division of Chronic Disease Prevention and Health Promotion is proud to share with you this report, “Changes in Modifiable Cardiovascular Disease Risk Factors Among African Americans: St. Louis, Kansas City, and the Bootheel: 1990-1996”. This report is the third in a series of monographs dealing with the burden of chronic diseases among minorities in Missouri. It highlights areas of concern related to the human and economic burden of cardiovascular disease and associated challenges for public health in Missouri.

In 1997, the Division established a goal of increasing the number of chronic disease reports available to the public health community of Missouri. This concerted effort of our Office of Surveillance, Research and Evaluation aims to provide critical information to public health professionals working in the chronic disease field for the planning and implementation of health promotion programs in Missouri.

It is our goal to share data and other information available from health assessments and surveillance in order to direct efforts toward improvement of the health status of the citizens we serve. This goal cannot be achieved unless we disseminate this very meaningful information to policy makers, planners, program managers and health professionals throughout the state in a timely manner.

I am pleased to share this report with you and others in the public health community. I look forward to a continuing flow of information from this Division which will help guide and direct our efforts in reaching our vision of “Healthy Missourians in Healthy Communities.”

Bernard R. Malone, M.P.A., Director
Division of Chronic Disease Prevention and Health Promotion

June 1999

Changes in Modifiable Cardiovascular Disease Risk Factors among African Americans in the City of St. Louis, Kansas City and the Bootheel Region of Missouri, 1990-1996

EXECUTIVE SUMMARY

Between 1990 and 1996 the Missouri Department of Health (MDOH) implemented various surveys with minority populations as a focus. This monograph discusses survey results from one survey in 1996 and two in 1990. In 1996, MDOH and the University of Missouri School of Journalism's Center for Advanced Social Research surveyed 2,095 adults in the City of St. Louis, Kansas City and the "Bootheel" region of Missouri. The 1990 Cardiovascular Disease (CVD) survey, conducted by MDOH, included data on more than 1,000 residents of the Bootheel. Also in 1990, the Smoking Cessation among Black Americans (SCBA) survey was conducted in collaboration with Washington University, St. Louis. This survey included over 2,000 individuals living in the City of St. Louis and Kansas City.

One of the goals of these surveys was to determine the prevalence of modifiable CVD risk factors in residents of the study regions. Risk factors of interest included physical inactivity, obesity, hypertension, unmonitored cholesterol, and smoking. Because our knowledge of modifiable CVD risk factors among African Americans is limited, communities with a high population of African Americans were selected. This monograph provides estimates of the percent change in modifiable CVD risk factors from 1990 to 1996 in the study regions. The results are as follows:

- ✔ During the study period, the three-region study population had a higher overall prevalence of smoking, obesity, hypertension and unmonitored cholesterol than the overall prevalence for the state of Missouri.
- ✔ Between 1990 and 1996, the overall prevalence of obesity increased in the study population, especially among African-American females.
- ✔ African-American males did not experience any statistically significant reductions in CVD risk factor prevalence rates between 1990 and 1996.

- ✔ Between 1990 and 1996, all other sex and race population subgroups experienced a significant decrease within one or more modifiable CVD risk factors. For example:

    - There was a statistically significant overall decrease in physical inactivity, especially among the white/other female population subgroup.

    - White/other females between age 18-34 showed a statistically significant decrease in the prevalence of self-reported hypertension.

- ✔ Individuals age 55 or older, those with a high school education or less and those without health care coverage experienced the least amount of reduction in CVD risk factors from 1990 to 1996.

These findings suggest that while the prevalence of CVD risk factors between 1990 and 1996 declined among some segments of the study region population, improvements are needed. Obesity is a greater problem in 1996, especially for African-American females. African-American females also lag behind other population subgroups in the reduction of physical inactivity. African-American males are the only group that showed no significant improvement in any modifiable CVD risk factor. Other groups with minimal improvement between 1990 and 1996 are individuals age 55 or older, those with a high school education or less and those without health care coverage.

These individuals need targeted efforts to reduce the prevalence of CVD risk factors. More refined analysis has been reported, clarifying which sociodemographic and health-related factors contribute most to the above-identified changes (Dietz et al. 1998).

INTRODUCTION

Cardiovascular disease (CVD) comprises diseases of the heart and the vessels, including ischemic heart disease and stroke. CVD is the leading cause of illness, disability, death and medical costs in the United States (Brownson et al. 1992b). Prevention and control of modifiable CVD risk factors such as smoking, physical inactivity, obesity, hypertension and high blood cholesterol are important public health issues in Missouri as in the United States. In 1989, cardiovascular disease accounted for 45% of all deaths in the state (Dabney et al. 1992). There has been no change in ranking since then and CVD continues to be the leading cause of death in Missouri (MDOH 1999).

In general, CVD and CVD-related risk factors are high in African American populations (Winkleby 1997). National data show that since the 1960s, whites have experienced a greater decline in deaths from heart disease than have African Americans. The mortality rate from coronary heart disease and stroke is much greater in African-American males than in white males (Brownson et al.. 1992a; MDOH 1999), while data from California show that African-American females have the highest age-adjusted coronary heart disease death rate of all ethnic groups (Winkleby 1997). It is estimated that 31% of excess mortality in African Americans can be related to the prevalence of modifiable CVD risk factors (Gregory and Clark 1992). In Missouri, cardiovascular mortality rates are higher among African Americans than for whites (MDOH 1999). Also, CVD mortality has decreased in the past 15 years, but more so for whites.

African Americans have higher smoking prevalence than whites, especially among males. More African Americans die of smoking-related diseases than of any other preventable cause of death (Gregory and Clark 1992). Physical inactivity rates are highest among African Americans and women (Folsom et al. 1991; Hagdrup et al. 1997), as well as those in the southeastern part of Missouri (Wilkins et al.. 1993). African-American females are almost twice as likely to be obese as white women (Dabney et al. 1992; Folsom et al. 1991), while there is no difference between African-American and white males (Liu et al. 1996). Prevalence rates of obesity have increased during the past ten years in Missouri, particularly among African Americans (Hagdrup et al. 1997). The rate of self-reported

hypertension is similar for all males, while African-American females have higher rates than white females (CDC 1994). African-American males are the population subgroup most likely to have unmonitored cholesterol in the state of Missouri (Brownson et al. 1992a). However, elevated cholesterol levels are higher among whites, with females having higher cholesterol levels than males (Keil et al. 1993; Muscat et al. 1994).

Our knowledge about modifiable CVD risk factors among ethnic minority groups in Missouri is limited. The purpose of this study was to analyze changes, if any, in modifiable CVD risk factors among African Americans in the three study regions between the years 1990 and 1996. These changes were compared to the changes that occurred among whites/others in the same regions over the same time period. The changes in CVD risk factor prevalence, or lack thereof, raise important public health and policy issues.

METHODS

Sampling

1990 CVD and SCBA Surveys and 1996 CVD Targeted Health Initiative Survey

In 1996, the Missouri Department of Health (MDOH), Division of Chronic Disease Prevention and Health Promotion (CDPHP) surveyed 2,095 residents of the City of St. Louis, Kansas City and the Bootheel region of Missouri. The Bootheel region included Mississippi, New Madrid, Pemiscot, Dunklin and Scott counties, but did not include Stoddard County. Telephone interviews were conducted by the CDPHP Office of Surveillance, Research and Evaluation (OSRE) and the Center for Advanced Social Research (CASR), University of Missouri-Columbia (MU) School of Journalism. Participants were selected by random-digit-dialing (RDD) techniques. CDPHP conducted two surveys in 1990. A CVD survey targeted residents of the Bootheel. The SCBA survey targeted individuals in the City of St. Louis and Kansas City. This survey was conducted jointly with Washington University in St. Louis (see Appendix A). CVD risk factor components of the questionnaires were nearly identical for the 1996 and 1990 surveys.

By selecting these three regions of the state and oversampling certain ZIP codes within regions, a deliberate attempt was made to include a large number of African Americans. Sample populations were identified using census data and ZIP codes to target areas with substantial African-American populations: City of St. Louis (40%-99%); Kansas City (20%-99%); and the Bootheel region (18%-46%). Data were weighted to compensate for unequal probability of selection and representation of some elements of the sample population (for example, young men are frequently undersampled in telephone surveys). See Appendix A for additional details regarding study methods.

Variable Definitions

For purposes of this study, data and respondents were categorized as follows:

- **Age—**Respondents were divided into three age groups: 18-34; 35-54; and 55 and older.
- **Race/ethnicity—**Respondents were categorized as African American, white or "other." The "other" group included Asian/Pacific Islanders, Native Americans and Hispanics. In this report we analyzed whites and others together for two reasons. First, there are only a small number of "other" ethnic/racial respondents in the study area. Second, the focus of this report is to highlight findings among African Americans.
- **Educational attainment—**Participants were divided into three groups: those with less than a high school diploma or its equivalent; those with a high school diploma or its equivalent; and those with more than a high school diploma.

- **Smoking habits—**Respondents were divided into three groups: current smokers; former smokers; and those who have never smoked.
- **Physical inactivity—**Participants were considered to be physically inactive if they answered "no" to the question: "During the past month, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?"
- **Body mass index (BMI)—**BMI, the standard method for defining obesity, was calculated by dividing weight in kilograms by height in meters squared. Respondents were divided into two groups: those with normal BMI or less (non-obese); and those with greater than normal BMI (obese). Women were considered obese if their BMI was 27.3 or higher; men were considered obese if their BMI was 27.8 or higher.
- **Frequency of hypertension—**Participants were considered hypertensive if they answered "yes" to the question: "Have you ever been told by a doctor that you have hypertension?"
- **Frequency of unmonitored cholesterol—**Participants were considered to have unmonitored blood cholesterol if they answered "no" to the question: "Have you ever had your blood cholesterol checked?"
- **Availability of health care coverage—**Participants were classified as having health care coverage based on their responses to the question: "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?"

Analysis

For each survey year, investigators generated race- and gender-specific prevalence estimates and 95% confidence intervals (CI) for self-reported hypertension and other cardiovascular risk factors such as current smoking, physical inactivity, obesity and unmonitored blood cholesterol. Investigators also generated race- and gender-specific percentage change in risk factors from 1990 to 1996. Percentage changes in the prevalence estimates from 1990 to 1996 that did not include zero were considered statistically significant.

Using population estimates from the survey and 1990 census data, investigators estimated the number of people who changed their behavior during the study period. However, estimates were not made for CVD risk factors by health care coverage or education. Information on health insurance and educational level was not available in the census data.

Graphs and Maps

A graph and map section was created to highlight the statistically significant changes that occurred in each study site (pages 29 - 38). Four sets of graphs and maps were produced: one for each study site and the whole study area. Each set contains two maps: one presenting the significant prevalence changes that occurred in the region and one presenting changes in estimated cases of modifiable CVD risk factors.

RESULTS

Current Smoking

Except when noted, all prevalence changes provided were statistically significant. For a more accurate perspective on changes in modifiable CVD risk factors by region and subgroups, refer to the graph and map section (pages 29 - 38).

From 1990 to 1996, a downward trend in smoking was observed among persons with health care coverage, primarily in white/other males (Figure 1). A downward trend in current smoking prevalence was also observed for African-American females age 18-34 (Figure 2). African-American males were the only population subgroup to exhibit an increase in current smoking rates from 1990 to 1996 (see Table 1, Appendix B). However, the increase was not statistically significant.

Figure 1:
PERCENT CHANGE IN CURRENT SMOKING BY SELECTED CHARACTERISTICS, 1990-1996

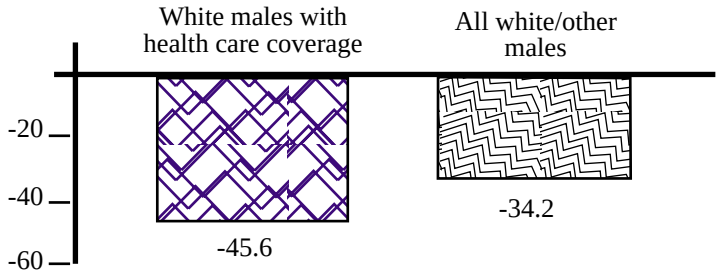
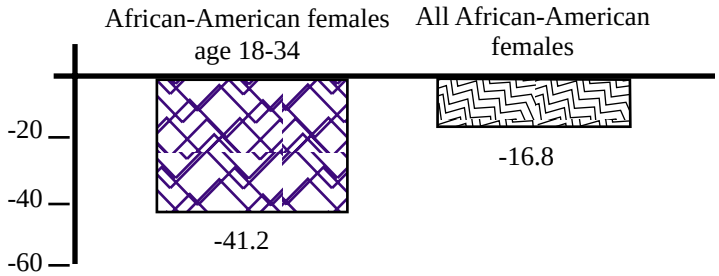


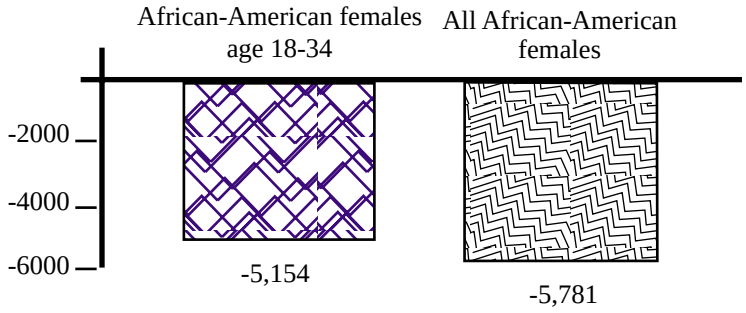
Figure 2:
PERCENT CHANGE IN CURRENT SMOKING BY SELECTED CHARACTERISTICS, 1990-1996



In 1996, the three-region estimated prevalence of current smoking was 29.0%, which was higher than the overall state prevalence rate of 27.7% (CDC 1997). Prevalence rates were highest among individuals age 35-54, those with less than a high school education and/or those without health care coverage. These differences were consistent across categories of gender and race.

In 1996, an estimated 5,154 fewer African-American females age 18-34 were smoking than in 1990 (Figure 3).

Figure 3:
ESTIMATE OF THE REDUCTION IN THE NUMBER OF INDIVIDUALS WHO SMOKE, 1990-1996



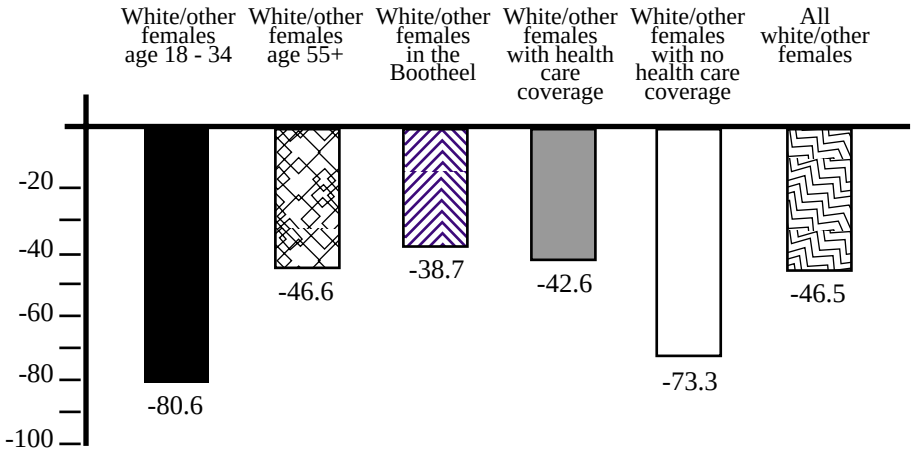
Footnote: Because data for health care coverage and education were not available from census information in a useable manner, synthetic estimates of risk factor changes by these variables were not calculated. Also, the observed prevalence rate for "all" white/other males was not statistically significant and thus was not calculated.

Physical Inactivity

From 1990 to 1996, there was a decrease in physical inactivity within the study regions (Table 2, Appendix B). In addition, there was a decrease in physical inactivity among residents of Kansas City that was not seen in any population subgroup (data not shown). Further stratification by gender and race revealed that no statistically significant changes occurred among African Americans. However, decreases among white/other females were identified in the Bootheel region for the youngest and oldest age groups (18-34 and 55 or older) and for those with and without health care coverage (see Figure 4). White/other males in the middle age group (35-54) and those with greater than a high school education also experienced a decrease in physical inactivity (Figure 5).

The three-region estimated prevalence of physical inactivity was 25.0% in 1996. This prevalence is lower than the overall state prevalence of 30.2% (CDC 1997). The overall rate shows variation by age and education, with the highest rates among persons age 55 and older and with less than a high school education. A higher rate of physical inactivity was observed for females vs. males. This difference was mostly driven by gender differences observed among African Americans.

Figure 4:
PERCENT CHANGE IN PHYSICAL INACTIVITY BY SELECTED CHARACTERISTICS, 1990-1996



It is estimated that 7,357 white/other females overall became physically active (i.e., no longer physically inactive) during the study period (Figure 6). Slightly fewer (6,894) white/other males became physically active during the study period (Figure 7).

Figure 5:
PERCENT CHANGE IN PHYSICAL INACTIVITY BY SELECTED CHARACTERISTICS, 1990-1996

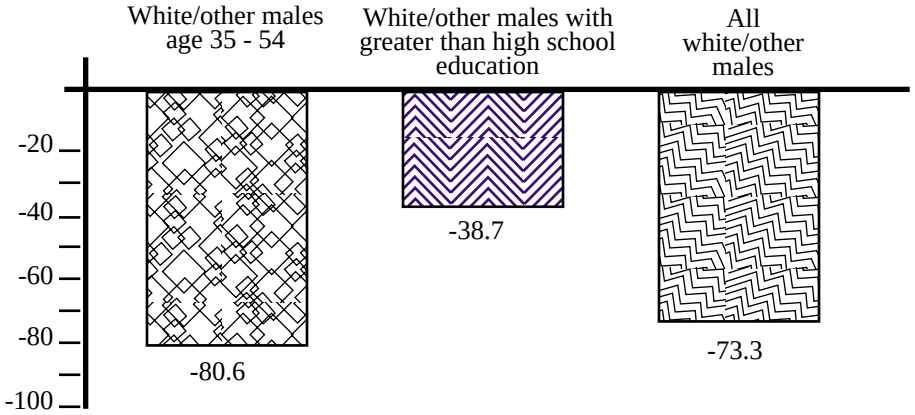


Figure 6:
ESTIMATE OF THE REDUCTION IN THE NUMBER OF PHYSICALLY INACTIVE INDIVIDUALS, 1990-1996

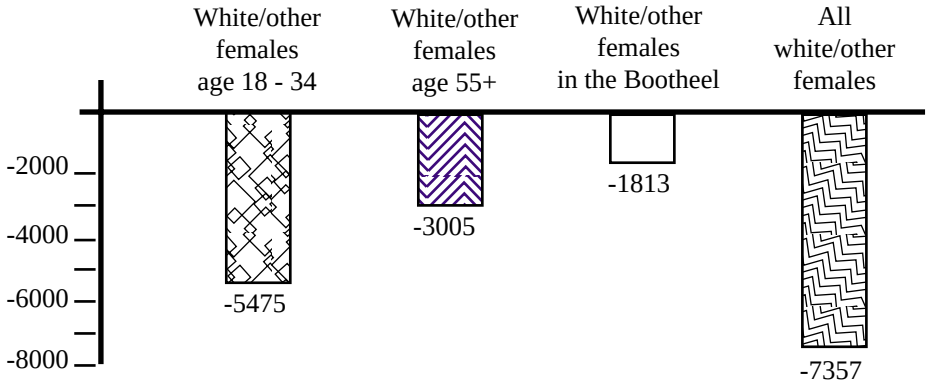
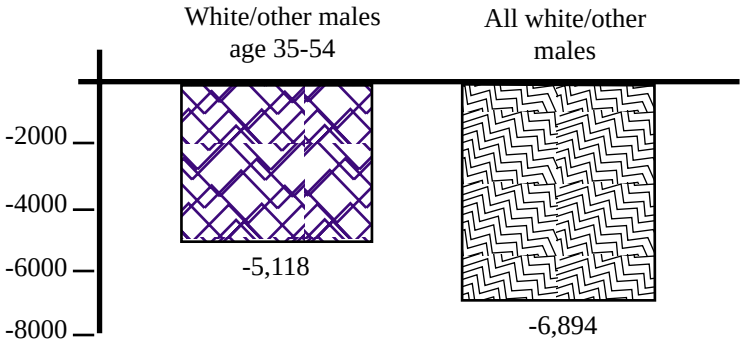


Figure 7:
ESTIMATE OF THE REDUCTION IN THE NUMBER OF PHYSICALLY INACTIVE INDIVIDUALS, 1990-1996



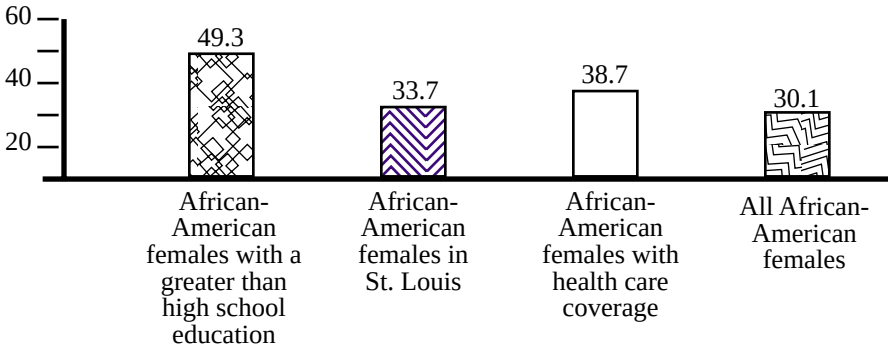
Footnote: Because data for health care coverage and education were not available from census information in a useable manner, synthetic estimates of risk factor changes by these variables were not calculated.

Obesity

From 1990 to 1996, there was an overall upward trend in obesity (Table 3, Appendix B). This trend is seen primarily in African Americans, especially among African-American females. Upward trends in the prevalence of obesity were observed among persons living in the City of St. Louis and persons with health care coverage. An upward trend was also observed for African-American females with more than a high school education (Figure 8).

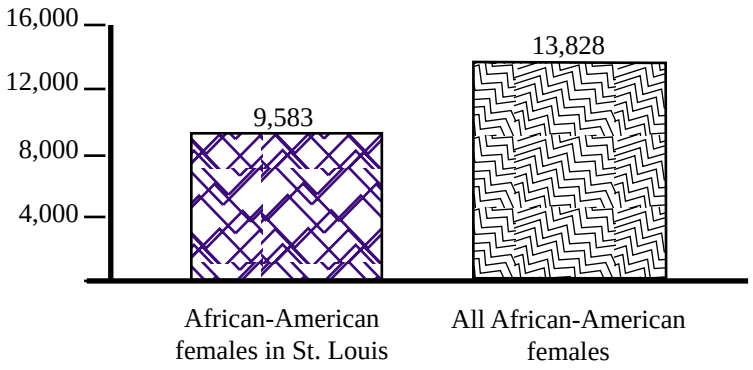
The three-region estimated prevalence of obesity was 40.1% in 1996, which is greater than the overall prevalence for the state of Missouri of 32.2% (CDC 1997). African Americans in the study regions have obesity rates above the state prevalence rate, while whites/others have prevalence rates below the state prevalence rate. Obesity rates increased with age and decreased with level of educational attainment, with the highest rates found among persons age 55 and older and those with less than a high school education. After stratification by gender and race, however, only the variation by age remained.

Figure 8:
PERCENT CHANGE IN OBESITY BY SELECTED CHARACTERISTICS, 1990-1996



An estimated 9,583 African-American females living in the City of St. Louis became obese over the study period. This accounts for over two-thirds of the estimated 13,828 African-American females who became obese during the study period (Figure 9).

Figure 9:
ESTIMATE OF THE INCREASE IN THE NUMBER OF OBESE INDIVIDUALS, 1990-1996



Footnote: Because data for health care coverage and education were not available from census information in a useable manner, synthetic estimates of risk factor changes by these variables were not calculated.

Hypertension

Examination of the 1990 and 1996 estimates indicate a statistically nonsignificant overall trend of increased prevalence of hypertension (Table 4, Appendix B). An upward trend in prevalence of hypertension was observed among persons with health care coverage (Figure 10). This result did not remain when stratified by gender or race. A significant downward trend in prevalence of hypertension was observed for white/other females age 18-34 (Figure 11).

Figure 10:
PERCENT CHANGE IN HYPERTENSION BY SELECTED CHARACTERISTICS, 1990-1996

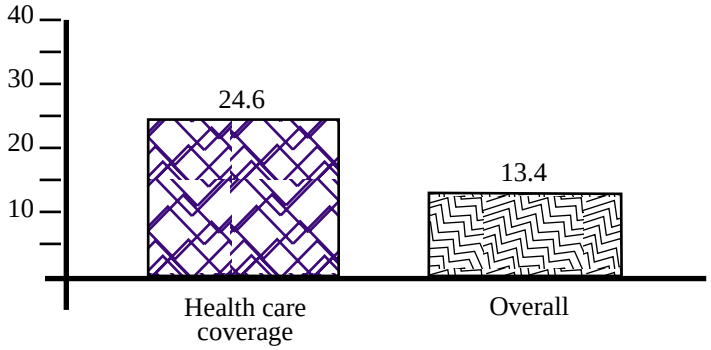
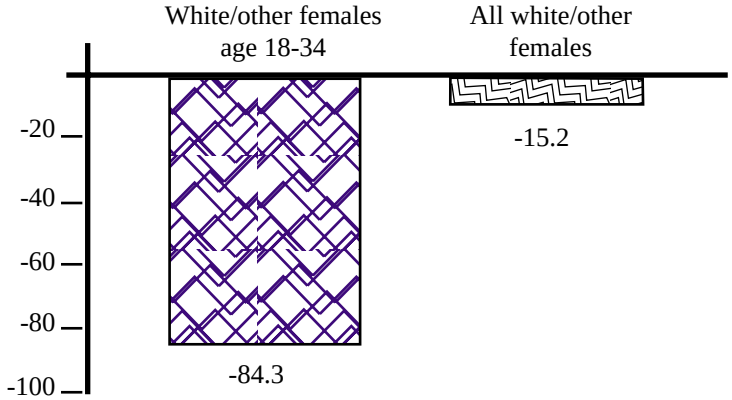


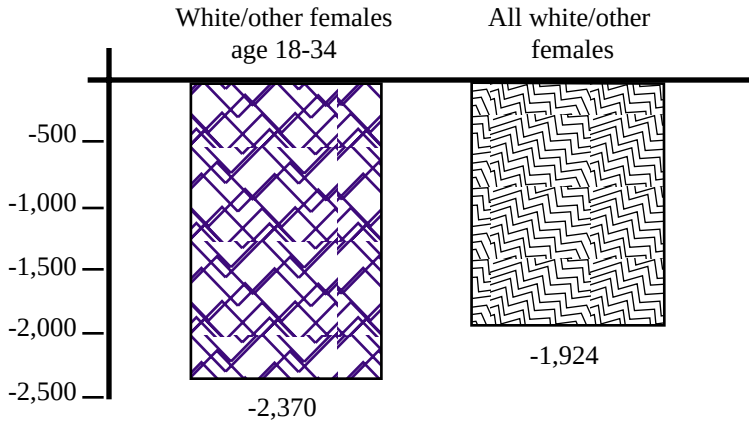
Figure 11:
PERCENT CHANGE IN HYPERTENSION BY SELECTED CHARACTERISTICS, 1990-1996



The three-region estimated prevalence of self-reported hypertension was 30.4% in 1996, which is higher than the overall state prevalence of 23.1% (CDC 1997). Overall prevalence of hypertension increased with age, decreased with education and increased among those with health care coverage. While the age effect was consistent across gender and race strata, the health care coverage effect was apparent only among African Americans and the education effect was apparent only among females.

An estimated 2,370 fewer 18-34 year old white/other females had hypertension over the course of the study period (Figure 12). However, only 1,923 fewer white/other females overall had hypertension. This means that while the prevalence of hypertension decreased among white/other females age 18-34, prevalence rates increased in the other age groups during the study period.

Figure 12:
ESTIMATE OF THE REDUCTION IN THE NUMBER OF HYPERTENSIVE INDIVIDUALS, 1990-1996



Footnote: Because data for health care coverage and education were not available from census information in a useable manner, synthetic estimates of risk factor changes by these variables were not calculated.

Unmonitored Cholesterol

From 1990 to 1996, there was an overall statistically nonsignificant downward trend in the prevalence of unmonitored cholesterol (Table 8, Appendix C). A downward trend in prevalence was observed among persons age 35-54 and among Kansas City residents. Further stratification reveals that the downward trend in the 35-54 year old respondents occurred primarily in white/other males and African-American females, while the decrease in Kansas City occurred primarily in white/other males (Figures 13 and 14, respectively). A downward trend in the prevalence of unmonitored cholesterol was observed in the white/other male population subgroup. White/other males with more than a high school education and those with health care coverage also experienced a downward trend.

Figure 13:
PERCENT CHANGE IN UNMONITORED CHOLESTEROL SELECTED CHARACTERISTICS, 1990-1996

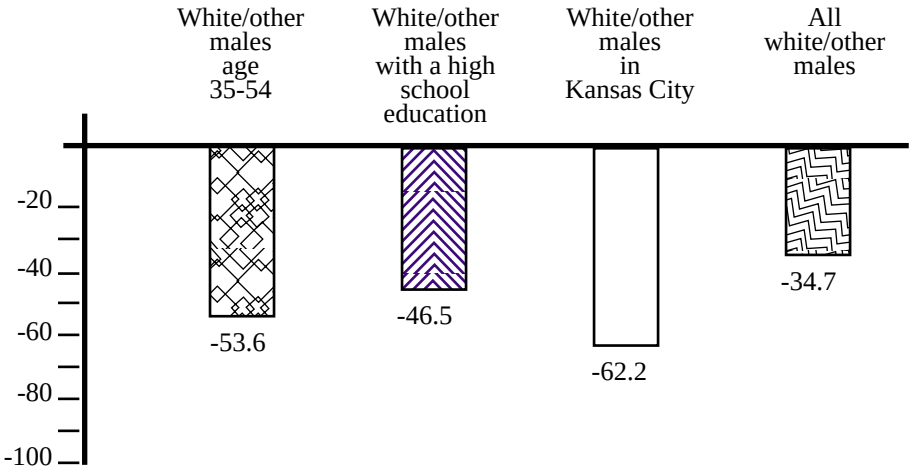
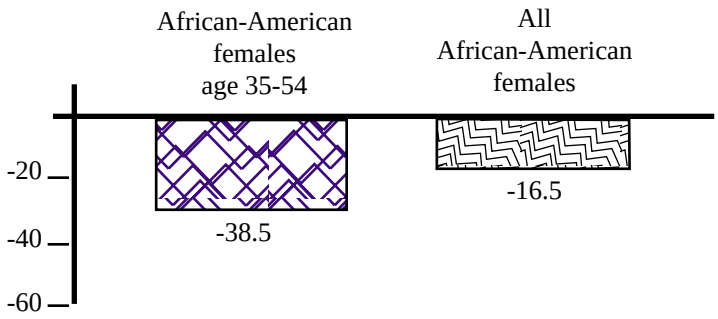
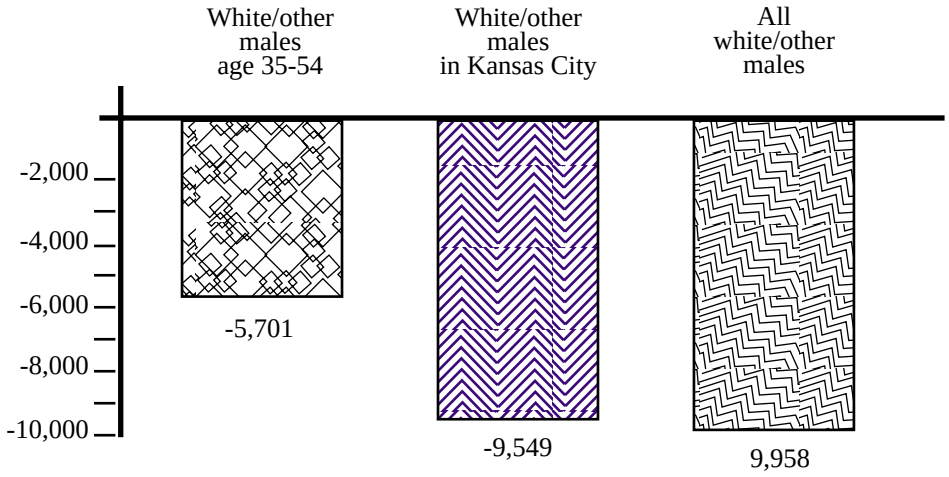


Figure 14:
PERCENT CHANGE IN UNMONITORED CHOLESTEROL BY SELECTED CHARACTERISTICS, 1990-1996



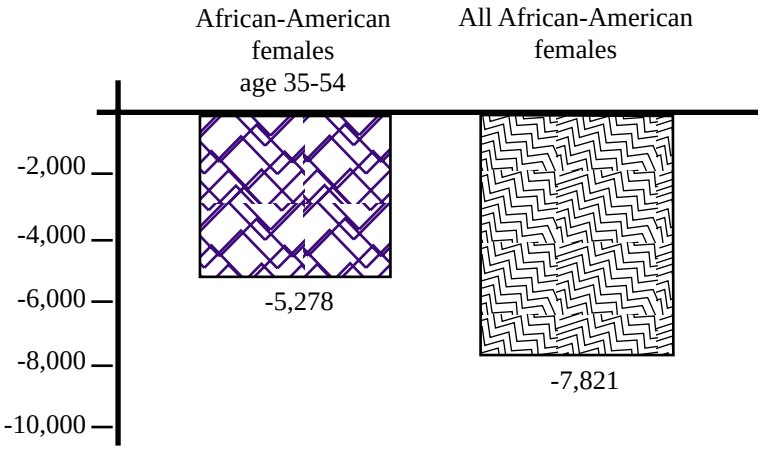
The three-region estimated prevalence of unmonitored cholesterol was 37.0% in 1996. This result is higher than the overall state prevalence of 23.7% (CDC 1997). Unmonitored cholesterol prevalence decreased with age, education and health care coverage. After further stratification, differences by educational level and health care coverage were only present among African-American females. A higher rate of unmonitored cholesterol was observed for males vs. females; this was apparent among both whites/others and African Americans.

Figure 15:
ESTIMATE OF THE REDUCTION IN THE NUMBER OF INDIVIDUALS WITH UNMONITORED CHOLESTEROL, 1990-1996



An estimated 5,701 fewer 35-54 year old white/other males, 9,549 fewer white/other males living in Kansas City and 9,958 fewer white/other males total have unmonitored cholesterol (Figure 15). For African-American females, 5,278 fewer females age 35-54 have unmonitored cholesterol. This accounts for two-thirds of the estimated 7,821 African-American females who no longer have unmonitored cholesterol (Figure 16).

Figure 16:
ESTIMATE OF THE REDUCTION IN THE NUMBER OF INDIVIDUALS WITH UNMONITORED CHOLESTEROL, 1990-1996



Footnote: Because data for health care coverage and education were not available from census information in a useable manner, synthetic estimates of risk factor changes by these variables were not calculated.

— Notes —

CONCLUSIONS AND RECOMMENDATIONS

In 1996, African Americans in the three-region study area had a higher prevalence rate in all modifiable CVD risk factors than did whites/others. Overall, African Americans, individuals age 55 and older, those with a high school education or less and those without health care coverage had the highest prevalence rates of modifiable CVD risk factors.

From 1990 to 1996, African-American males were the only racial and gender group to experience no improvement in CVD risk factors. African-American females showed an increase in obesity, while white/other females were the only racial and gender group that showed no increase in any modifiable CVD risk factor.

A greater than high school education was associated with decreased prevalence of obesity among all males, an overall decrease in the prevalence of smoking and an increase in the prevalence of obesity among African-American females during the study period. Having health care coverage was associated with an overall decrease in smoking, an overall increase in obesity and an overall increase in the prevalence of hypertension over the study period.

A lack of health care coverage was associated with an overall decrease in the prevalence of physical inactivity. The prevalence of physical inactivity also decreased more among younger individuals and those living in Kansas City and the Bootheel. African Americans, individuals over the age of 55, those with a high school education or less and those without health care coverage experienced the least improvement in CVD risk factor prevalence rates over the study period.

In Missouri and the United States, African Americans experience both higher CVD and CVD risk factor prevalence rates than other ethnic groups (Brownson et al. 1992a, b; Centers for Disease Control and Prevention 1994; Hagdrup et al. 1997; Winkleby 1997). This fact, combined with the relatively slow decrease of modifiable CVD risk factor prevalence rates, could pose serious health risks for African Americans living in Missouri.

Miller and colleagues (1997) show that smoking was directly attributable for almost 20% of all deaths in Missouri in 1995. Of these deaths, 65% were among males. African Americans in this study had higher smoking rates than other ethnic groups in the three-region study area and also showed a slower rate of decrease from 1990 to 1996. However, there was no significant difference in smoking rates by race in Missouri, after controlling for age, sex and education (Hagdrup et al. 1997). Statewide, individuals age 18-34, males and/or those with less than a high school education were more likely to be smokers. Individuals within the above demographic and health-related groups, and African Americans in the three-region study area, may be more likely to die from a smoking-related cause and have a decreased life expectancy due to smoking.

While the overall prevalence of physical inactivity decreased slightly, but significantly, from 1990 to 1996 in the three-region study period, physical inactivity remains a problem, especially among African Americans. The majority of the decrease in physical inactivity occurred among the white/other group. These results are similar to the statewide results (Hagdrup et al. 1997). Physical inactivity rates are highest among African Americans, females, individuals with less than a high school education and/or those over the age of 55.

African-American females have the highest rate of obesity in the study area. In 1996, the rate of obesity was slightly over twice as great among African-American females as among white/other females in Missouri, which is consistent with nation-wide data (Folsom et al. 1991). However, over the past ten years, females, particularly African American females, experienced the greatest increase in obesity among racial and gender population subgroups from 1990 to 1996 statewide (Hagdrup et al. 1997). Among demographic and health-related factors, obesity rates are highest among those with less than a high school education and those between the ages of 35 and 64.

The study results for self-reported hypertension are consistent with national reports. Blood pressure increases with advancing age, especially among African Americans (Guo et al. 1994). In addition, the great discrepancy seen in hypertension between African-American and white/other females is consistent with other studies (Gregory and Clark 1992). Unmonitored cholesterol rates are consistent with national studies. African-American males are the least likely population subgroup to have their cholesterol levels checked (Brownson et al. 1992a). Although the rate of elevated cholesterol levels is higher among whites/others than among African Americans, and higher among women, it is still important for all individuals to have their cholesterol levels checked (Keil et al. 1993; Muscat et al. 1994). Elevated cholesterol levels may be indicative of a high-fat diet and/or problems related to smoking or lack of exercise (Muscat et al. 1994).

In summary, the prevalence of CVD risk factors is still high in these three regions of Missouri. African Americans have higher risk factor prevalence rates and experience less improvement in these risk factors than whites/others during the study period. Increased efforts are needed to target the subgroups that are most at risk and maintain an overall public health initiative to decrease CVD risk factors. CVD is largely preventable, especially if 1) prevention practices are incorporated into everyday life; 2) the population has easy access to services; and 3) these are community-wide environmental changes that allow communities to take up healthier lifestyles. It is important for health professionals and public health officials to become more involved with interventions that improve CVD risk factor prevalence, especially among the most at-risk populations, in order to continue the positive changes that have occurred.

— Notes —

Sociodemographic Tables

— Notes —

Table 1: Sociodemographic profile of 1990 CVD survey respondents-Unweighted

		number	percentage
Age	18-34	236	23.5
	35-54	346	34.4
	55+	422	41.9
	Unknown	2	00.2
Gender	Female	619	61.5
	Male	387	38.5
Race	African American	66	6.6
	White/other	940	93.4
Education	High school or less	772	76.7
	>high school	231	23.0
Location	Bootheel	1,006	100.0
Income	<$15,000	391	38.9
	$15,000-$24,999	235	23.4
	>$25,000	254	25.2
	Unknown	126	12.5
Smoking	Current	260	25.8
	Former	221	21.9
	Never	518	51.5
Physical Inactivity	No	456	45.3
	Yes	505	50.2
	Unknown	45	4.5
Obesity	Obese	275	27.3
	Non-obese	694	69.0
	Unknown	37	3.7
Cholesterol	Checked	578	57.5
	Never checked	406	40.4
	Unknown	20	1.9
Hypertension	Yes	333	33.1
	No	673	66.9
Health Coverage	Yes	1,697	81.1
	No	325	15.5
	Unknown	70	3.3
Total N		1006	

Table 2: Sociodemographic profile of 1990 SCBA survey respondents-Unweighted

		number	percentage
Age	18-34	767	36.7
	35-54	612	29.2
	55+	679	32.5
	Unknown	34	1.6
Gender	Female	1,367	65.3
	Male	725	34.7
Race	African American	1,564	74.8
	White/other	528	25.2
Education	High school or less	1,315	62.9
	>high school	756	36.1
Location	St. Louis	1,050	50.2
	Kansas City	1,042	49.8
Income	<$15,000	933	44.6
	$15,000-$24,999	419	20.0
	>$25,000	381	18.2
	Unknown	359	17.2
Smoking	Current	677	32.4
	Former	406	19.4
	Never	1,009	48.2
Physical Inactivity	No	1,397	66.8
	Yes	693	33.1
	Unknown	2	0.1
Cholesterol	Checked	1,191	56.9
	Never checked	858	41.0
	Unknown	43	2.1
Hypertension	Yes	664	31.7
	No	1,425	68.1
Health Coverage	Yes	1,697	81.1
	No	325	15.5
	Unknown	70	3.3
Total N		2,092	

Table 3: Sociodemographic profile of 1996 survey respondents-Unweighted

		number	percentage
Age	18-34	580	27.7
	35-54	731	34.9
	55+	771	36.8
	Unknown	13	0.6
Gender	Female	1,309	62.5
	Male	786	37.5
Race	African American	1,320	63.0
	White/other	764	36.5
Education	High school or less	1,171	55.9
	>high school	918	43.8
Location	St. Louis	989	47.2
	Kansas City	703	33.6
	Bootheel	403	19.2
Income	<$15,000	862	41.1
	$15,000-$24,999	429	20.5
	>$25,000	612	29.2
	Unknown	192	9.2
Smoking	Current	611	29.2
	Former	452	21.6
	Never	1,029	49.1
Physical Inactivity	No	1,459	69.6
	Yes	636	30.4
Female Obesity	Non-obese	663	53.1
	Obese	586	46.9
Male Obesity	Non-obese	513	66.2
	Obese	262	33.8
Hypertension	No	1,337	35.9
	Yes	750	63.9
	Unknown	5	0.2
Cholesterol Checked	Checked	1,407	67.2
	Never Checked	614	29.3
	Unknown	74	3.5
Total N		2,095	

— Notes —

Graphs & Maps

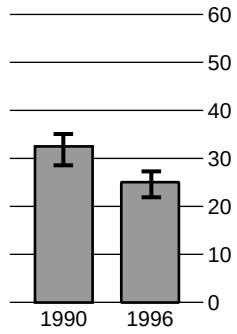
— Notes —

Missouri Study Sites

Changes in Prevalence of Modifiable Cardiovascular Disease Risk Factors

Physical Inactivity

Prevalence Rate by Year (per hundred)

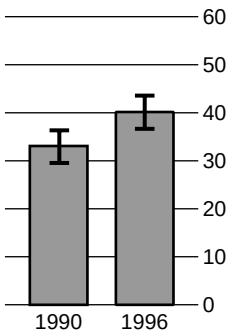


All Groups

Missouri had a 22.4% decrease in physical inactivity prevalence for all groups between 1990 and 1996.

Obesity

Prevalence Rate by Year (per hundred)

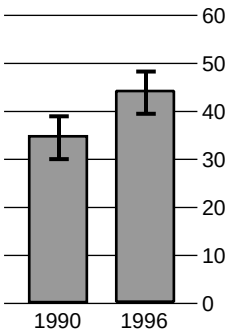


All Groups

Missouri had a 21.5% increase in obesity prevalence for all groups between 1990 and 1996

Obesity

Prevalence Rate by Year (per hundred)

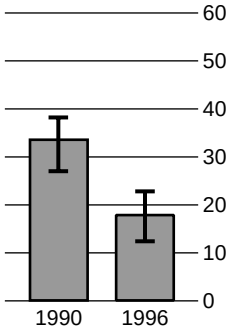


All Females

Missouri had a 27.2% increase in obesity prevalence for all females between 1990 and 1996.

Physical Inactivity

Prevalence Rate by Year (per hundred)

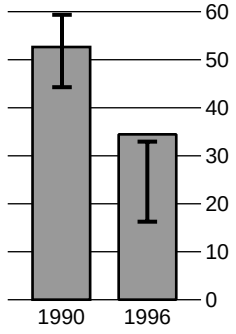


White/Other Females

Missouri had a 46.5 % decrease in physical inactivity prevalence for white and other females between 1990 and 1996.

Unmonitored Cholesterol

Prevalence Rate by Year (per hundred)

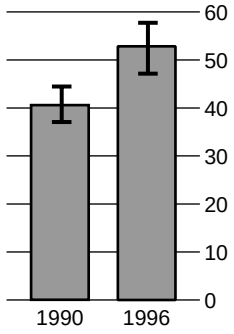


White/Other Males

Missouri had a 34.7 % decrease in unmonitored cholesterol prevalence for white and other males between 1990 and 1996.

Obesity

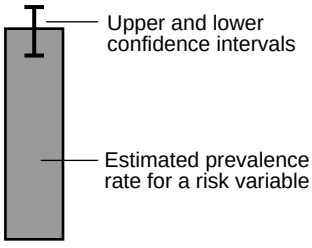
Prevalence Rate by Year (per hundred)



African-American Females

Missouri had a 30.1% increase in obesity prevalence for African-American females between 1990 and 1996.

Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.

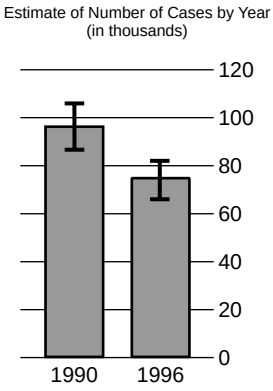


Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

Missouri Study Sites

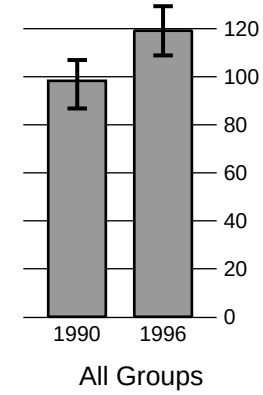
Changes in Estimated Number of Cases of Modifiable Cardiovascular Disease Risk Factors

Physical Inactivity



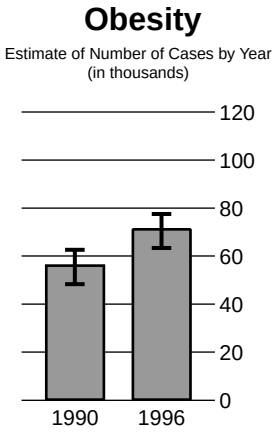
All Groups

Obesity



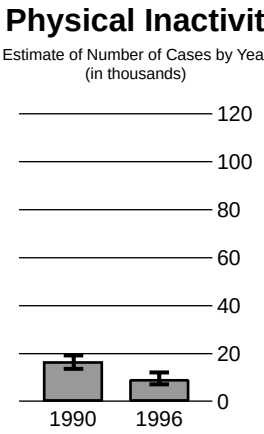
All Groups

Obesity



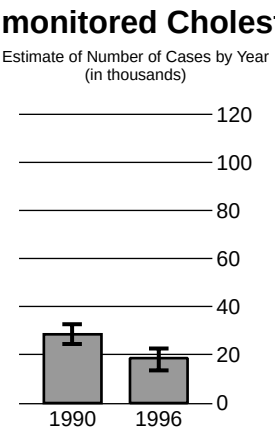
All Females

Physical Inactivity



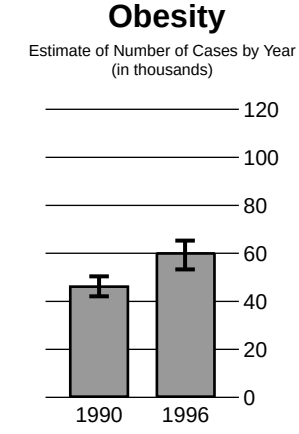
White/Other Females

Unmonitored Cholesterol



White/Other Males

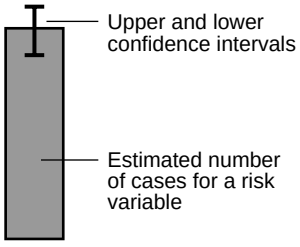
Obesity



African-American Females

The estimated number of cases for each risk factor was calculated by multiplying the three study sites' susceptible population by its weighted prevalence rate for people age 18 or older.

Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.



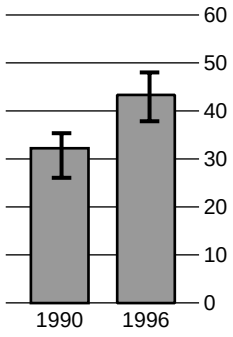
Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

St. Louis City

Changes in Prevalence of Modifiable Cardiovascular Disease Risk Factors

Obesity

Prevalence Rate by Year (per hundred)

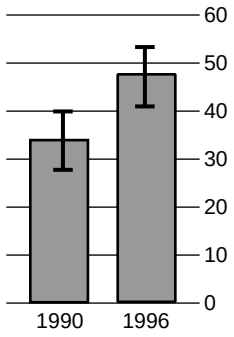


All Groups

St. Louis had a 34.2% increase in obesity prevalence for all groups between 1990 and 1996.

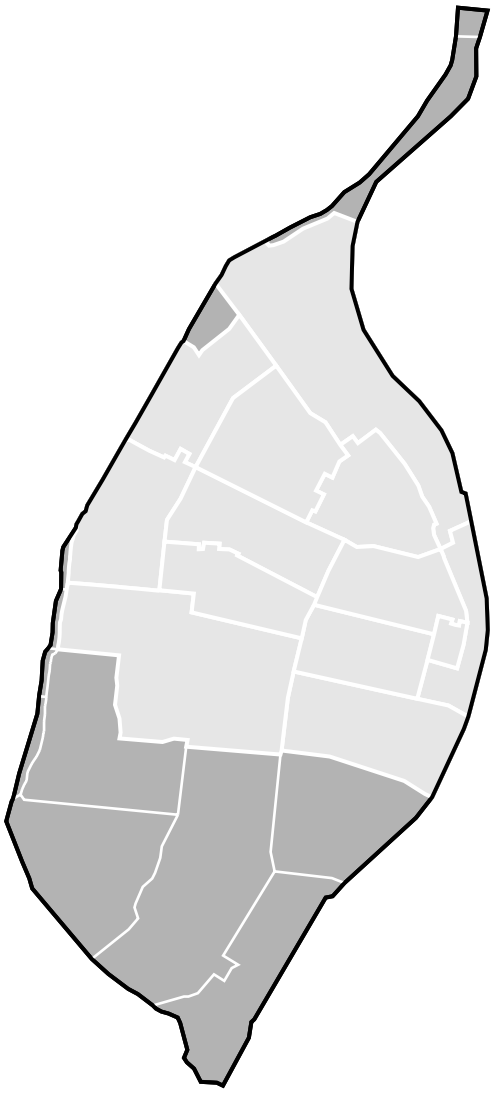
Obesity

Prevalence Rate by Year (per hundred)



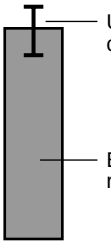
All Females

St. Louis had a 39.8% increase in obesity prevalence for all females between 1990 and 1996.



ZIP code included in study area

ZIP code not included in study area

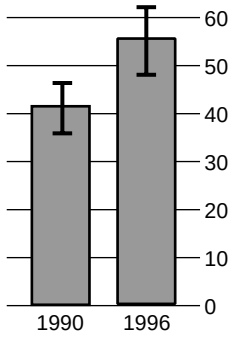


Upper and lower confidence intervals

Estimated prevalence ratefor a risk variable

Obesity

Prevalence Rate by Year (per hundred)



African-American Females

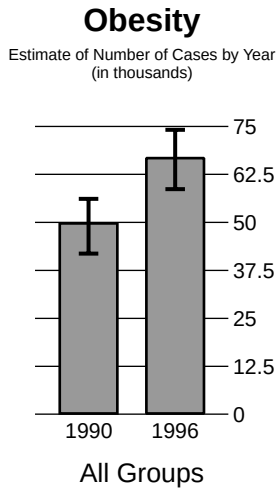
St. Louis had a 33.7% increase in obesity prevalence for African-American females between 1990 and 1996.

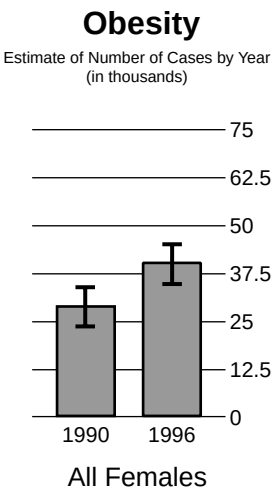
Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.

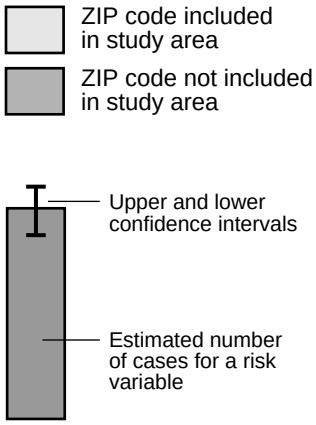
Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

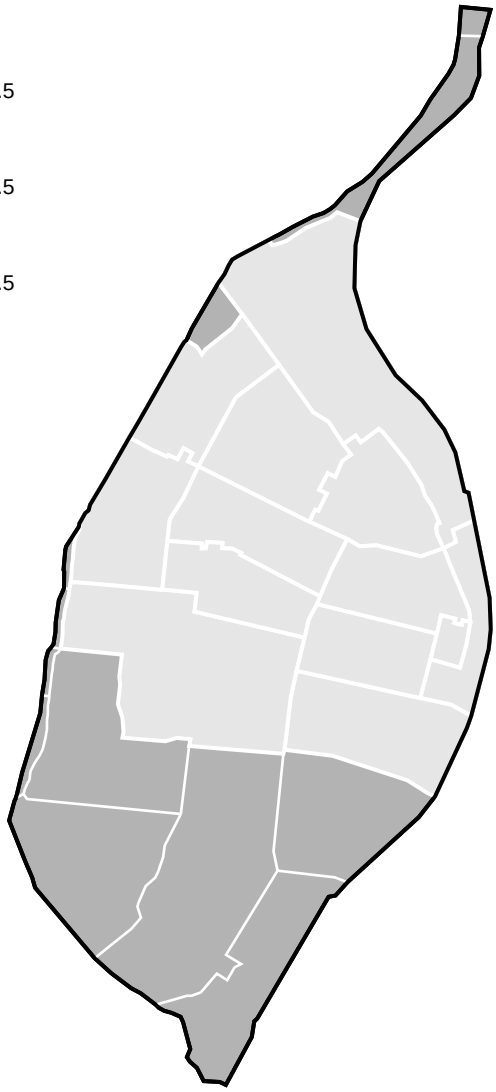
St. Louis City

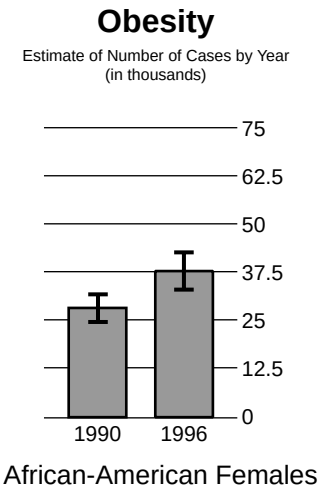
Changes in Estimated Number of Cases of Modifiable Cardiovascular Disease Risk Factors











The estimated number of cases for each risk factor was calculated by multiplying St. Louis City's susceptible population by its weighted prevalence rate for people age 18 or older.

Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.

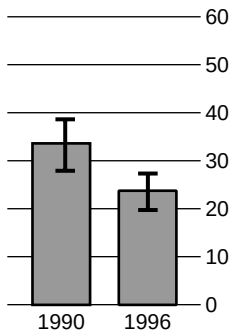
Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

Kansas City

Changes in Prevalence of Modifiable Cardiovascular Disease Risk Factors

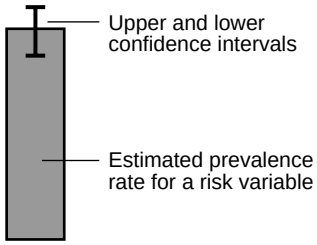
Physical Inactivity

Prevalence Rate by Year (per hundred)



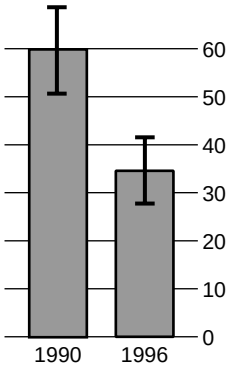
All Groups

Kansas City had a 29.5% decrease in physical inactivity prevalence for all groups between 1990 and 1996.



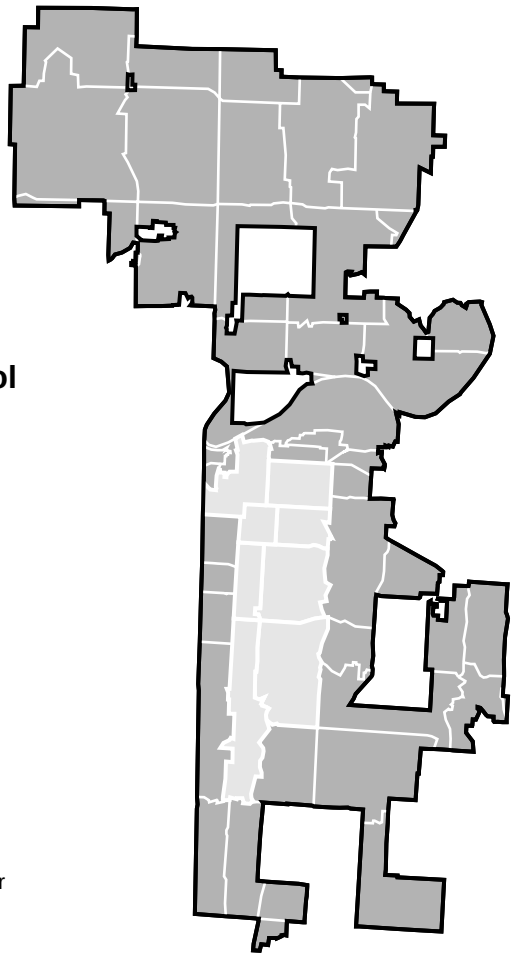
Unmonitored Cholesterol

Prevalence Rate by Year (per hundred)



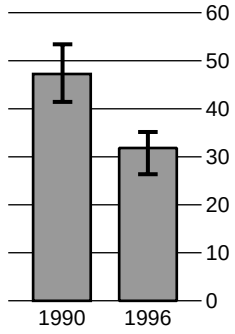
All Males

Kansas City had a 42.2% decrease in unmonitored cholesterol prevalence for all males between 1990 and 1996.



Unmonitored Cholesterol

Prevalence Rate by Year (per hundred)

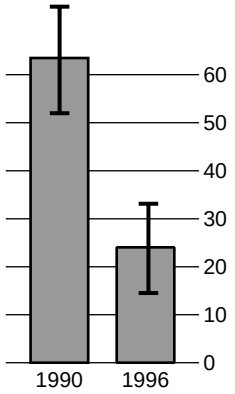


All Groups

Kansas City had a 32.4% decrease in unmonitored cholesterol prevalence for all groups between 1990 and 1996.

Unmonitored Cholesterol

Prevalence Rate by Year (per hundred)

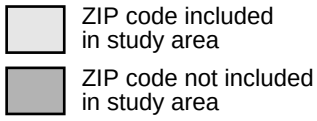


White/Other Males

Kansas City had a 62.2% decrease in unmonitored cholesterol prevalence for white and other males between 1990 and 1996.

The estimated number of cases for each risk factor was calculated by multiplying Kansas City's susceptible population by its weighted prevalence rate for people age 18 or older.

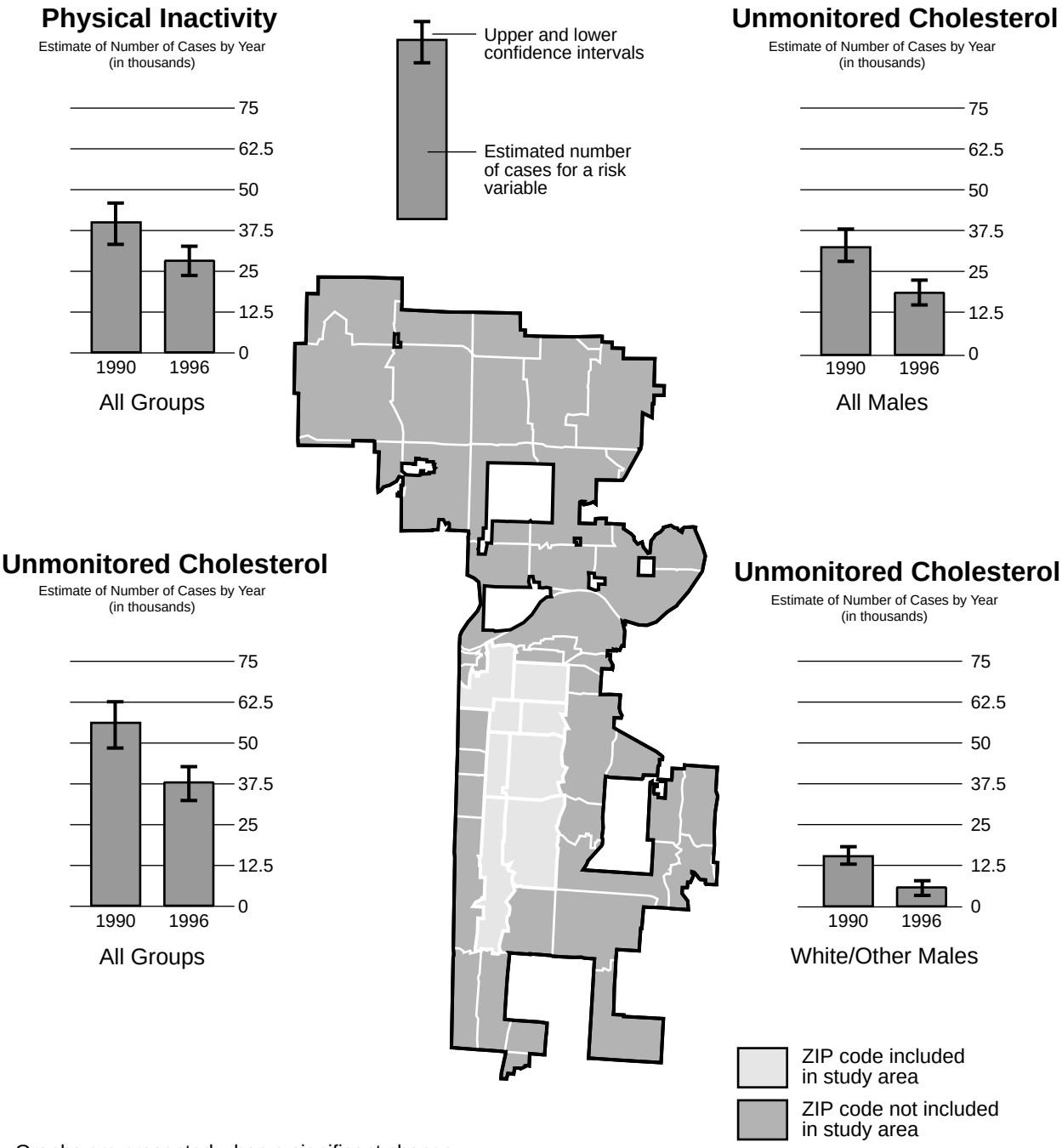
Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.



Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

Kansas City

Changes in Estimated Number of Cases of Modifiable Cardiovascular Disease Risk Factors



Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.

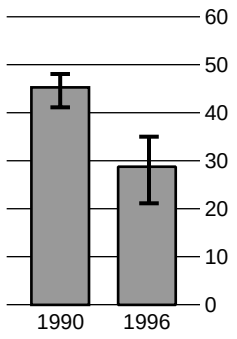
Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

Bootheel Region

Changes in Prevalence of Modifiable Cardiovascular Disease Risk Factors

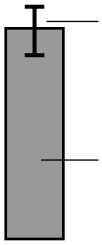
Physical Inactivity

Prevalence Rate by Year (per hundred)



All Groups

The Bootheel Region had a 36.4% decrease in physical inactivity prevalence for all groups between 1990 and 1996.

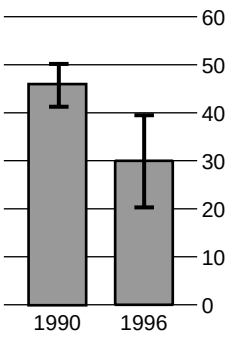


Upper and lower confidence intervals

Estimated prevalence rate for a risk variable

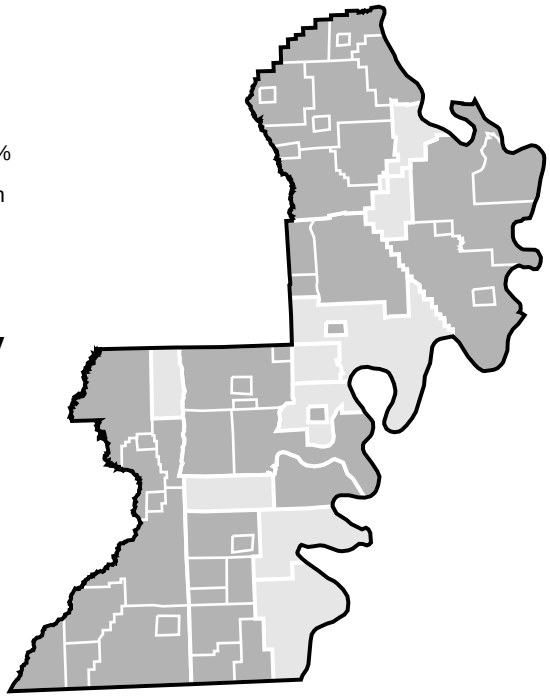
Physical Inactivity

Prevalence Rate by Year (per hundred)



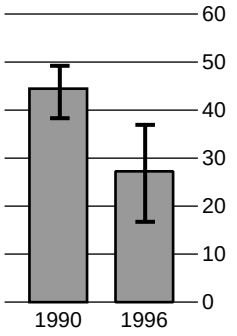
All Females

The Bootheel Region had a 34.8% decrease in physical inactivity prevalence for all females between 1990 and 1996.



Physical Inactivity

Prevalence Rate by Year (per hundred)

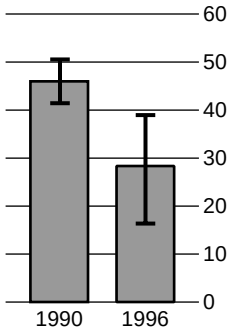


All Males

The Bootheel Region had a 38.7% decrease in physical inactivity prevalence for all males between 1990 and 1996.

Physical Inactivity

Prevalence Rate by Year (per hundred)



White/Other Females

The Bootheel Region had a 38.7% decrease in physical inactivity prevalence for white and other females between 1990 and 1996.

ZIP code included in study area

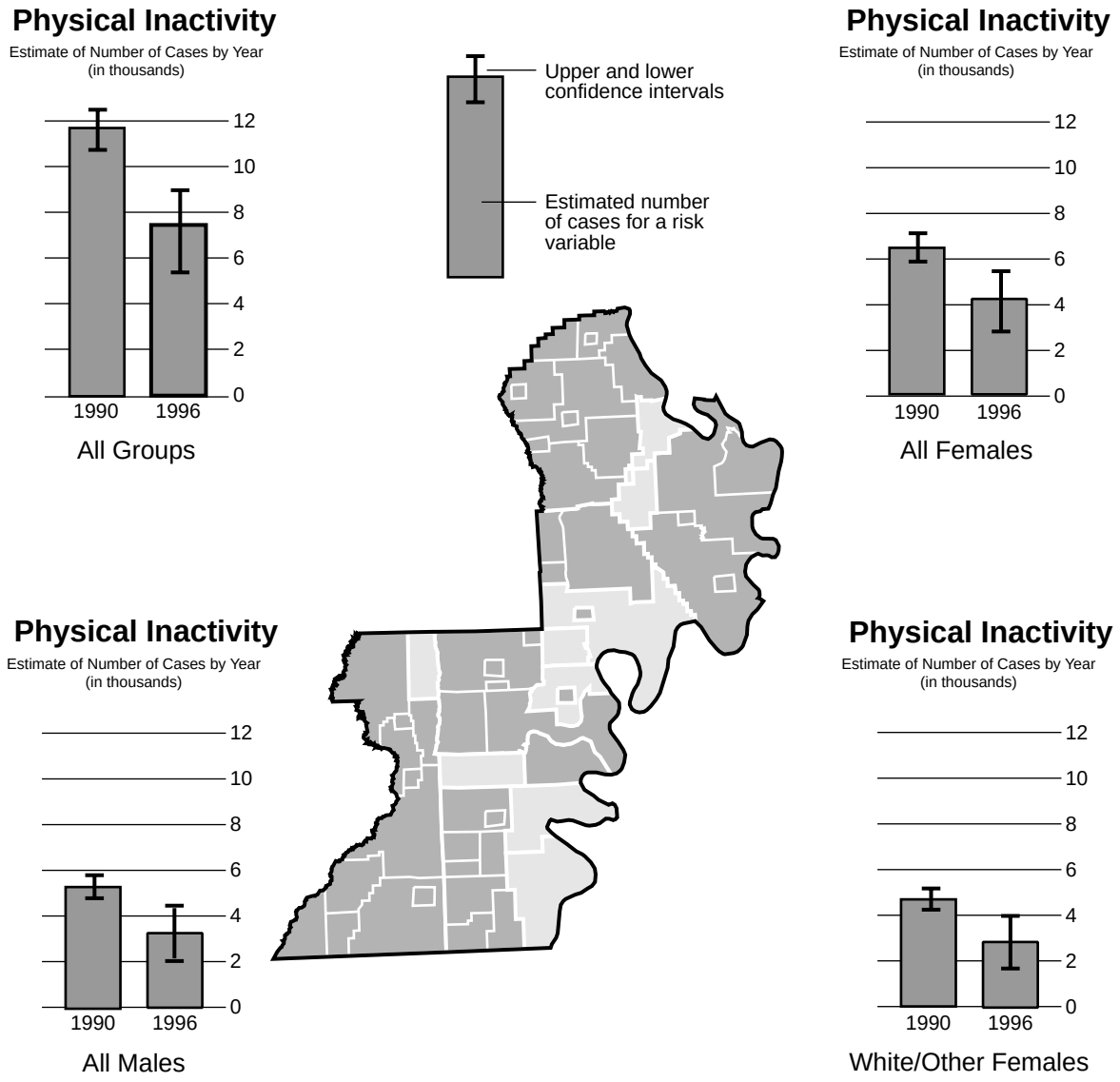
ZIP code not included in study area

Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.

Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

Bootheel Region

Changes in Estimated Number of Cases of Modifiable Cardiovascular Disease Risk Factors



The estimated number of cases for each risk factor was calculated by multiplying the Bootheel Region's susceptible population by its weighted prevalence rate for people age 18 or older.

Graphs are presented when a significant change has occurred. Other risk factors are not included because either no change occurred or the change was small and not statistically significant.

ZIP code included in study area

ZIP code not included in study area

Map by Edward L. Kinman and Todd D. Heibel
University of Missouri-Columbia, Geography Department

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— Notes —

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Appendices

— Notes —

APPENDIX A

METHODS OF SAMPLING AND ANALYSIS

Sampling

1996 - Cardiovascular Disease Targeted Health Initiative Survey (CVD-THI)

Using random-digit-dialing (RDD) techniques, the Missouri Department of Health, Division of Chronic Disease Prevention and Health Promotion (MDOH-CDPHP), Office of Surveillance, Research and Evaluation (OSRE) and the Center for Advanced Social Research (CASR), University of Missouri-Columbia (MU) School of Journalism, sampled 2,095 individuals from specific zip codes in the City of St. Louis, Kansas City and the extreme southeastern part of the state known as the "Bootheel."

CASR provided a 1990 census data listing of households and respective telephone numbers in the City of St. Louis. A list purchased from a commercial phone bank firm, R.L. Polk Inc., provided full address and household telephone numbers for the Kansas City area. Based on the proportional representation of African Americans, we selected zip codes in the City of St. Louis with a 40% or higher African-American population. Seven of the ten zip codes we selected in Kansas City also had an African-American population of 40% or higher; the remaining three zip codes had an African-American population bertween 20% and 30%. We cross tabulated the selected zip codes with telephone prefixes using these lists. A combination of area code and prefixes was then used to generate the original list of telephone numbers available for sample, after elimination of prefixes occurring at lower frequency per zip code (20 or less).

The sampling strategy varied by region. For the majority of interviews conducted by OSRE, a two-stage modified Mitofsky-Waksberg cluster sampling frame was used. We first screened a generated random sample of possible telephone numbers to obtain stage one numbers (area code + prefix + suffix). If the stage one number was determined to be a working, residential telephone number, 99 additional numbers having the same first eight digits (three-digit area code + three-digit prefix + first two digits of the suffix) were generated. This set of 100 numbers constituted the primary sampling unit (PSU) or cluster. For two smaller areas in both the City of St. Louis and Kansas City, represented by a few zip codes, simple random samples of all possible telephone numbers for the areas were also generated.

For the Bootheel region, CASR used a two-stage cluster sampling technique similar to the above and stratified by two sets of zip codes. For another smaller set of telephone numbers in selected zip codes of Kansas City, CASR used a simple random sampling frame as described above.

Once a telephone number was selected, computer assisted telephone interviewing (CATI) was implemented. CATI allows for random selection of eligible respondents within a household while maintaining the integrity of planned design by keeping the actual versus expected number of interviews per cluster more or less constant. It also allows for standardization in the number of callbacks. For the CASR samples, the CATI system also allowed for an equally likely representation of female, male, older and younger respondents as well as minimum within-sampling-unit non-coverage error.

Prior to excluding from further analyses observations with missing, inappropriate or non-response values for variables included in the analysis, the analytical samples presented varied from 1,903 to 2,095, depending on the variables being cross-tabulated. The fruit/vegetable index variable had more missing observations from analysis than any other variable; 227 respondents (10.8% of the sample) either did not know or failed to provide constituent information. Item non-response greater than three percent was also observed for household income (192 respondents: 9.2% of the sample), unmonitored cholesterol (74 observations: 3.5% of the sample) and obesity (71 respondents: 3.4% of the sample). For these variables, missing data were imputed using general linear modeling techniques based on the more complete data in the analysis.

For other variables, missing, inappropriate or non-response values constituted one percent or less of the total sample. Observations with residual missing data were excluded from the analysis, leaving a final sample of 1,979 observations.

1990 - Cardiovascular Disease (CVD) and Smoking Cessation in Black Americans (SCBA) surveys

The 1990 CVD survey was funded by CDC and the SCBA survey was funded by the National Heart, Lung, and Blood Institute (NHLBI). The SCBA project was conducted in collaboration with Washington University in St. Louis. These surveys targeted three at-risk regions in Missouri: the six-county region in the extreme southeast corner of the state known as the "Bootheel" (CVD); four inner-city neighborhoods in the City of St. Louis (SCBA); and four inner-city neighborhoods in Kansas City (SCBA). RDD techniques were used within these study areas, which was a simple random sample. Telephone prefixes for the regions were provided by several small, independent companies.

Once a telephone number was selected, CATI was implemented in a similar manner as the 1996 survey. CATI allowed only one household member, 18 years of age or older, to complete the survey. The survey period ended when a minimum of 1,000 interviews were completed in each survey area. There were 1,006 completed interviews in the Bootheel, 1,050 completed interviews in St. Louis City and 1,042 completed interviews in Kansas City.

Analysis

When necessary, data were weighted to compensate for unequal probability of sampling selection as a function of stratification, clustering, unequal number of telephone numbers and adults per households. We also weighted the data to compensate for unequal representation of the source population according to sex, race and age (post-stratification). This weighting also minimizes non-response and non-coverage which are differential across those groups defined by sex, age and race.

We generated weighted prevalence estimates for sociodemographic elements (gender, education level and location of residence), health care coverage (insurance), self-reported hypertension, blood cholesterol screening and other cardiovascular disease related factors, including body mass index (BMI), physical activity and smoking status. In addition, we generated race- and age-specific weighted prevalence estimates and 95% confidence intervals (95% C.I.) for

self-reported hypertension, cholesterol screening and other cardiovascular risk factors across levels of age, education, location of residence and health care coverage. We generated race- and age-specific percentage change in prevalence estimates and 95% confidence intervals (95% C.I.) for hypertension, cholesterol screening and other cardiovascular disease-related factors across levels of age, education, location of residence and health care coverage.

Synthetic population estimates were made using survey results and 1990 census data. We applied statistically significant prevalence trends to Missouri 1990 census data. However, synthetic estimates were not calculated for CVD risk factors by health care coverage or education, as this information is only available in the census at the state level.

Sample Description

1996

The 1996 sample respondents were mostly individuals age 45 or older (52.2%), female (62.5%), African American (63%), with a high school education or less (55.9%) and/or with an annual household income of $15,000 or less (41.1%). The sample has an almost proportional representation of the surveyed areas (City of St. Louis, Kansas City and the Bootheel region). Weighted frequencies minimized some of the above noted differences by race, gender, age, education, income and region. However, these differences remained after weighting and the distribution closely resembles the 1990 census information on these population subgroups.

A majority (56.9%) of St. Louis' population lives in the study area as well as a large majority of the city's African-American population (92.4%). The study area contains 75.8% of the population living below the poverty level, considerably higher than the area's base population. The proportion of the city's population 25 years or older with no college education is slightly lower than would be expected at 53.6%.

The study area in Kansas City contains only 37.4% of Kansas City's total population but 81.3% of the city's African-American population. The study area contains 64.8% of the city's population living below the

poverty level, which is almost twice as high as the area's base population. The study area contains a majority (53.6%) of Kansas City's population 25 years or older with no college education.

The ZIP codes sampled in the Bootheel study area contain 28.9% of the Bootheel's total population and 61% of the region's African-American population. The study area contains 36.1% of the region's population living below the poverty level, which is higher than expected given the area's population base. By comparison, the proportion of the Bootheel population 25 years or older with no college education is close to expected at 28.3%.

1990

The SCBA survey respondents were mostly individuals age 18-34 (36.7%), female (65.3%), African American (74.8%), with a high school education or less (62.9%) and/or with an annual household income of $15,000 or less (44.6%). The sample has an almost proportional representation of respondents from the City of St. Louis and Kansas City.

The CVD survey respondents were mostly individuals age 55 or older (42.1%), female (61.5%), white/other ethnicity (93.4%), with a high school education or less (76.7%) and/or with an annual household income of $15,000 or less (38.9%).

Weighted frequencies in these two surveys minimized some of the above noted differences by race, gender, age, education, income and region. However, these differences remained after weighting and the distribution closely resembles the 1990 census information on these population subgroups.

Limitations of the Study

Data for this study were collected through telephone interviews with adult (18 years of age and older) residents of the three study areas. As a result, adult residents without access to a residential telephone had no opportunity to be considered during the random selection process.

All of the data are self-reported. Therefore, recall error or bias is always a possibility. Also, the respondents may have compromised their real behavior to look more socially desirable. For example, women are known to under-report their weight and men over-report their height (Hagdrup et al. 1997). This underestimates the BMI for both men and women. Reliability of self-reported high blood cholesterol is poor, thus the report of cholesterol testing may also be poor. However, reliability is strong for self-reported hypertension and smoking.

In order to obtain additional information, and possibly validate telephone survey responses, face-to-face interviews were conducted in one ZIP code —63115— in the City of St. Louis. These results will be reported elsewhere. Residents of ZIP code 63115 were oversampled in the telephone survey so that comparisons could be made between the face-to-face and telephone interview results. These results will also be reported separately.

Appendix B
Data Tables

Table 1: 1990-1996 Percent Changes with Confidence Intervals for Current Smoking

		White/Other Male Percent Change	White/Other Male Lower Confidence Limit	White/Other Male Upper Confidence Limit	White/Other Female Percent Change	White/Other Female Lower Confidence Limit	White/Other Female Upper Confidence Limit
	Overall	-34.2	-68.5	0.1	-11.1	61.7	39.5
Age	18-34	-13.1	-100.0	82.5	-5.6	-87.9	76.7
	35-54	-41.7	-84.4	1.0	1.5	-88.7	91.7
	55+	-45.0	-100.0	15.8	-33.8	-100.0	38.1
Education	<High School	4.5	-78.4	87.4	-5.2	-88.5	78.1
	High School	-27.6	-100.0	60.6	6.5	-89.5	100.0
	>High School	-34.3	-88.4	19.8	-1.9	-92.1	88.3
Location	St. Louis	-40.7	-95.6	14.2	-17.4	-98.3	63.5
	Kansas City	-33.3	-82.9	16.3	-6.6	-78.7	65.5
	Bootheel	-17.9	-67.1	31.3	6.2	-43.2	55.6
Health Care Coverage	Yes	-45.6	-80.7	-10.5	-21.7	-65.4	22.0
	No	36.2	-84.5	100.0	55.1	-41.7	100.0

		Black Male Percentage Change	Black Male Lower Confidence Limit	Black Male Upper Confidence Limit	Black Female Percentage Change	Black Female Lower Confidence Limit	Black Female Upper Confidence Limit
	Overall	5.2	-30.1	40.5	-16.8	-41.5	7.9
Age	18-34	3.7	-60.2	67.6	-41.2	-77.5	-4.9
	35-54	18.7	-25.6	63.0	-9.0	-43.9	25.9
	55+	-10.2	-72.5	52.1	11.2	-53.7	76.1
Education	<High School	39.6	-32.5	100.0	15.8	-36.7	68.3
	High School	-2.7	-51.1	45.7	-28.5	-64.0	7.0
	>High School	-7.3	-63.7	49.1	-24.0	-67.1	19.1
Location	St. Louis	27.5	-27.0	82.0	-17.9	-51.8	16.0
	Kansas City	-16.2	-57.9	25.5	-15.2	-52.0	21.6
	Bootheel	-35.7	-100.0	83.9	-4.1	-100.0	100.0
Health Care Coverage	Yes	-2.4	-42.2	-37.4	-21.1	-48.7	6.5
	No	12.2	-49.9	74.3	-1.0	-53.7	51.7

Table 1 (continued): 1990-1996 Percent Changes with Confidence Intervals for Current Smoking

		All Male Percent Change	All Male Lower Confidence Limit	All Male Upper Confidence Limit	All Female Percent Change	All Female Lower Confidence Limit	All Female Upper Confidence Limit	All Percent Change	All Lower Confidence Limit	All Upper Confidence Limit
	Overall	-17.2	-44.2	9.8	-12.7	-38.0	12.6	-15.0	-34.0	4.0
Age	18-34	-3.3	-66.0	59.4	-30.9	-70.9	9.1	-17.6	-52.1	16.9
	35-54	-18.3	-58.5	21.9	3.4	-49.1	55.9	-9.4	-42.5	23.7
	55+	-30.4	-78.8	18.0	-4.8	-64.8	55.5	-17.6	-54.4	19.2
Education	<High School	-4.5	-64.5	55.5	-4.5	-56.2	47.2	-4.4	-44.4	35.6
	High School	-13.6	-68.9	41.7	-11.6	-64.7	41.5	-13.6	-44.4	17.2
	>High School	-18.9	-62.2	24.4	-8.3	-65.7	49.1	-13.3	-46.2	19.6
Location	St. Louis	-9.2	-52.7	34.3	-13.9	-49.8	22.0	-11.1	-39.7	17.5
	Kansas City	-25.1	-62.1	11.9	-10.2	-62.1	41.7	-18.0	-45.6	9.6
	Bootheel	-19.9	-64.8	25.0	0.8	-45.5	47.1	-9.9	-45.8	26.0
Health Care	Yes	-28.8	-57.6	-0.0	-19.1	-47.3	9.1	-24.5	-45.5	-3.5
Coverage	No	16.7	-58.0	91.4	16.6	-52.0	85.2	17.1	-34.3	68.5

Table 2: 1990-1996 Percent Changes with Confidence Intervals for Physical Inactivity

		White/Other Male Percent Change	White/Other Male Lower Confidence Limit	White/Other Male Upper Confidence Limit	White/Other Female Percent Change	White/Other Female Lower Confidence Limit	White/Other Female Upper Confidence Limit
	Overall	-39.9	-80.1	0.3	-46.5	-79.2	-13.8
Age	18-34	-57.6	-100.0	23.9	-80.6	-100.0	-28.1
	35-54	-70.6	-100.0	-24.5	12.7	-100.0	100.0
	55+	19.6	-67.0	100.0	-46.4	-88.5	-4.3
Education	<High School	0.0	-100.0	100.0	-35.8	-100.0	40.8
	High School	17.1	-87.6	100.0	-37.4	-99.3	24.5
	>High School	-59.2	-100.0	-5.3	-40.6	-100.0	29.0
Location	St. Louis	-13.5	-100.0	100.0	-52.2	-100.0	16.2
	Kansas City	-43.0	-95.7	9.7	-45.5	-97.2	6.2
	Bootheel	-39.0	-78.4	0.4	-38.7	-73.0	4.4
Health	Yes	-36.4	-82.1	-9.3	-42.6	-79.1	-6.1
Care Coverage	No	-52.6	-100.0	23.4	-73.3	-100.0	-3.7

		Black Male Percentage Change	Black Male Lower Confidence Limit	Black Male Upper Confidence Limit	Black Female Percentage Change	Black Female Lower Confidence Limit	Black Female Upper Confidence Limit
	Overall	-5.1	-47.2	37.0	-12.5	-34.5	9.5
Age	18-34	56.7	-60.5	100.0	-25.5	-65.1	14.1
	35-54	-27.1	-85.7	31.5	1.8	-37.2	40.8
	55+	-25.9	-72.5	20.7	-14.3	-43.7	15.1
Education	<High School	-19.1	-83.6	45.4	-18.1	-48.9	12.7
	High School	-10.4	-69.2	48.4	-1.9	-36.8	33.0
	>High School	40.3	-62.6	100.0	-8.7	-56.5	39.1
Location	St. Louis	25.9	-47.0	98.8	-8.5	-38.5	21.5
	Kansas City	-27.0	-74.6	20.6	-18.0	-50.1	14.1
	Bootheel	-50.9	-100.0	21.0	-26.1	-100.0	56.2
Health	Yes	8.3	-42.7	59.3	-9.3	-34.2	15.6
Care Coverage	No	-35.5	-100.0	36.5	-25.3	-69.0	18.4

Table 2 (continued): 1990-1996 Percent Changes with Confidence Intervals for Physical Inactivity

		All Male Percent Change	All Male Lower Confidence Limit	All Male Upper Confidence Limit	All Female Percent Change	All Female Lower Confidence Limit	All Female Upper Confidence Limit	All Percent Change	All Lower Confidence Limit	All Upper Confidence Limit
	Overall	-28.1	-59.7	3.5	-18.0	-40.9	4.9	-22.4	-40.6	-4.2
Age	18-34	-8.7	-100.0	83.8	-42.0	-81.6	-2.4	-30.6	-67.4	6.2
	35-54	-57.2	-97.0	-17.4	22.5	-29.8	74.8	-21.9	-54.4	10.6
	55+	-6.4	-63.6	50.8	-19.6	-49.2	10.0	-15.3	-40.8	10.2
Education	<High School	-26.0	-99.1	47.1	-18.9	-58.1	20.3	-21.3	-49.7	7.1
	High School	0.4	-64.7	65.5	-1.5	-49.3	46.3	-0.0	-38.2	38.2
	>High School	-40.2	-91.6	11.2	-17.7	-66.1	30.7	-29.1	-64.4	6.2
Location	St. Louis	18.6	-55.5	92.7	-6.5	-43.2	30.2	0.8	-34.1	35.7
	Kansas City	-39.6	-80.2	1.0	-21.2	-59.6	17.2	-29.5	-56.9	-2.1
	Bootheel	-38.7	-73.6	-3.8	-34.8	-65.4	-4.2	-36.4	-59.1	-13.7
Health Care Coverage	Yes	-20.7	-57.5	16.1	-16.6	-41.7	8.5	-17.9	-38.7	2.9
	No	-48.7	-100.0	9.9	-26.5	-77.1	24.1	-39.0	-77.6	-0.4

Table 3: 1990-1996 Percent Changes with Confidence Intervals for Obesity

		White/Other Male Percent Change	White/Other Male Lower Confidence Limit	White/Other Male Upper Confidence Limit	White/Other Female Percent Change	White/Other Female Lower Confidence Limit	White/Other Female Upper Confidence Limit
	Overall	-1.6	-60.0	56.8	-21.6	-58.1	14.9
Age	18-34	-1.5	-100.0	100.0	-59.5	-100.0	12.2
	35-54	-11.8	-90.0	66.4	-4.3	-93.9	85.3
	55+	21.4	-81.9	100.0	-8.2	-70.9	54.5
Education	<High School	-5.7	-100.0	100.0	-39.6	-92.7	13.5
	High School	-14.5	-100.0	86.0	-8.8	-86.5	100.0
	>High School	-5.5	-78.6	89.6	-4.1	-95.4	87.2
Location	St. Louis	14.0	-86.9	100.0	-21.4	-100.0	66.2
	Kansas City	-16.5	-100.0	70.9	-27.8	-76.4	20.8
	Bootheel	22.2	-33.7	78.1	30.0	-43.5	100.0
Health Care Coverage	Yes	2.6	-58.6	63.8	-21.8	-61.0	17.4
	No	-28.9	-100.0	100.0	-20.6	-100.0	100.0

		Black Male Percentage Change	Black Male Lower Confidence Limit	Black Male Upper Confidence Limit	Black Female Percentage Change	Black Female Lower Confidence Limit	Black Female Upper Confidence Limit
	Overall	14.7	-19.2	48.6	30.1	8.0	52.2
Age	18-34	49.8	-25.3	100.0	51.2	-2.1	100.0
	35-54	-27.8	-68.4	12.8	23.0	-11.3	57.3
	55+	31.8	-24.1	87.7	16.9	-12.7	46.5
Education	<High School	24.4	-46.0	94.8	23.9	-9.4	57.2
	High School	29.4	-33.5	92.3	25.3	-10.4	61.0
	>High School	-6.1	-55.3	43.1	49.3	4.2	94.4
Location	St. Louis	15.5	-29.0	60.0	33.7	3.9	63.5
	Kansas City	11.8	-40.9	64.5	26.0	-7.9	59.9
	Bootheel	3.3	-100.0	100.0	5.0	-99.5	100.0
Health Care Coverage	Yes	21.3	-17.5	60.1	38.7	13.4	64.0
	No	3.2	-73.8	80.2	-3.9	-47.2	39.4

Table 3 (continued): 1990-1996 Percent Changes with Confidence Intervals for Obesity

		All Male Percent Change	All Male Lower Confidence Limit	All Male Upper Confidence Limit	All Female Percent Change	All Female Lower Confidence Limit	All Female Upper Confidence Limit	All Percent Change	All Lower Confidence Limit	All Upper Confidence Limit
	Overall	13.9	-20.2	48.0	27.2	1.5	52.9	21.5	0.9	42.1
Age	18-34	28.5	-41.5	98.5	31.1	-28.1	90.3	30.0	-15.5	75.5
	35-54	-18.7	-71.8	34.4	30.3	-13.0	73.6	6.8	-30.0	43.6
	55+	51.9	-10.6	100.0	24.1	-9.4	57.6	31.3	-0.3	62.9
Education	<High School	32.5	-42.8	100.0	10.9	-27.3	49.1	18.0	-16.9	52.9
	High School	13.6	-50.9	78.1	37.8	-6.7	82.3	28.7	-6.8	64.2
	>High School	7.6	-48.5	63.7	53.7	-1.2	100.0	29.8	-7.0	66.6
Location	St. Louis	27.1	-23.1	77.3	39.8	3.5	76.1	34.2	4.0	64.4
	Kansas City	-2.5	-67.8	62.8	10.9	-33.8	55.6	5.1	-33.1	43.3
	Bootheel	24.5	-26.5	75.5	38.0	-22.8	98.8	30.3	-9.1	69.7
Health Care Coverage	Yes	18.9	-18.5	56.3	29.1	1.3	56.9	25.2	1.9	48.5
	No	-1.7	-96.4	93.0	15.5	-51.1	82.1	5.1	-53.1	63.3

Table 4: 1990-1996 Percent Changes with Confidence Intervals for Hypertension

		White/Other Male Percent Change	White/Other Male Lower Confidence Limit	White/Other Male Upper Confidence Limit	White/Other Female Percent Change	White/Other Female Lower Confidence Limit	White/Other Female Upper Confidence Limit
	Overall	-5.5	-61.1	72.1	-15.2	-55.0	24.6
Age	18-34	65.3	-100.0	100.0	-84.3	-100.0	-7.5
	35-54	-41.1	-100.0	28.1	44.7	-62.9	100.0
	55+	36.1	-32.7	100.0	-13.4	-64.6	37.8
Education	<High School	-30.7	-100.0	99.6	-3.1	-75.0	68.8
	High School	88.8	-75.3	100.0	17.9	-87.9	100.0
	>High School	-0.8	-91.4	89.8	-5.7	-100.0	99.7
Location	St. Louis	94.3	-60.9	100.0	-14.0	-100.0	90.3
	Kansas City	-25.6	-100.0	68.7	-3.9	-78.6	70.8
	Bootheel	16.2	-50.2	82.6	-23.7	-65.8	18.4
Health Care Coverage	Yes	13.0	-58.3	84.3	-15.5	-58.0	27.0
	No	-29.5	-100.0	100.0	-6.6	-100.0	100.0

		Black Male Percentage Change	Black Male Lower Confidence Limit	Black Male Upper Confidence Limit	Black Female Percentage Change	Black Female Lower Confidence Limit	Black Female Upper Confidence Limit
	Overall	-10.2	-43.7	23.3	15.2	-9.3	39.7
Age	18-34	-23.9	-100.0	85.3	47.7	-37.2	100.0
	35-54	-11.3	-61.9	39.3	1.2	-39.4	41.8
	55+	12.7	-45.2	19.8	5.6	-16.4	27.6
Education	<High School	-3.2	-59.3	52.9	18.1	-14.6	50.8
	High School	-31.3	-84.4	21.8	25.9	-19.4	71.2
	>High School	5.3	-59.4	70.0	10.1	-37.3	57.5
Location	St. Louis	-21.5	-65.4	22.4	16.8	-15.9	49.5
	Kansas City	8.0	-42.8	58.8	12.3	-25.7	50.3
	Bootheel	20.1	-100.0	100.0	-5.2	-95.4	85.0
Health Care Coverage	Yes	4.6	-32.8	42.0	19.4	-7.3	46.1
	No	-43.9	-100.0	27.1	-8.5	-67.5	50.5

Table 4 (continued): 1990-1996 Percent Changes with Confidence Intervals for Hypertension

		All Male Percent Change	All Male Lower Confidence Limit	All Male Upper Confidence Limit	All Female Percent Change	All Female Lower Confidence Limit	All Female Upper Confidence Limit	All Percent Change	All Lower Confidence Limit	All Upper Confidence Limit
	Overall	5.6	-37.5	48.7	19.1	-7.8	46.0	13.4	-8.6	35.4
Age	18-34	12.2	-100.0	100.0	10.0	-83.7	100.0	10.7	-58.3	79.7
	35-54	16.7	-80.6	47.2	46.0	-12.2	100.0	10.8	-36.2	57.8
	55+	24.2	-17.9	66.3	14.2	-16.6	45.0	17.6	-5.1	40.3
Education	<High School	11.4	-69.2	92.0	19.7	-15.2	54.6	16.3	-18.6	51.2
	High School	13.6	-61.5	88.7	40.1	-12.8	93.0	31.5	-12.6	75.6
	>High School	4.8	-61.1	70.7	28.1	-28.2	84.4	16.3	-22.9	55.5
Location	St. Louis	22.0	-36.4	80.4	37.1	-3.9	78.1	30.7	-3.4	64.8
	Kansas City	-3.3	-72.3	65.7	13.6	-38.9	66.1	6.1	-36.0	48.2
	Bootheel	17.8	-42.0	77.6	-13.5	-51.9	24.9	-1.3	-30.3	27.7
Health Care	Yes	23.0	-17.8	63.8	24.9	-4.7	54.5	24.6	0.3	48.9
Coverage	No	-45.3	-100.0	28.2	-10.7	-88.9	67.5	-29.4	-79.4	20.6

Table 5: 1990-1996 Percent Changes with Confidence Intervals for Unmonitored Cholesterol

		White/Other Male Percent Change	White/Other Male Lower Confidence Limit	White/Other Male Upper Confidence Limit	White/Other Female Percent Change	White/Other Female Lower Confidence Limit	White/Other Female Upper Confidence Limit
	Overall	-34.7	-64.9	-4.5	-24.2	-58.1	9.7
Age	18-34	-19.6	-76.6	37.4	-16.7	-73.9	40.5
	35-54	-53.6	-94.0	-13.2	-36.0	-98.1	26.1
	55+	-30.6	-100.0	66.4	-29.9	-100.0	45.6
Education	<High School	-28.2	-98.6	42.2	-38.9	-100.0	27.0
	High School	-46.5	-91.4	-1.6	-16.1	-100.0	76.2
	>High School	-11.7	-78.3	54.9	-20.9	-86.0	44.2
Location	St. Louis	26.3	-56.2	100.0	-18.3	-90.0	53.4
	Kansas City	-62.2	-94.3	-30.1	-34.0	-86.9	18.9
	Bootheel	-15.3	-52.0	21.4	-14.6	-51.8	22.6
Health Care Coverage	Yes	-35.5	-71.2	0.2	-22.9	-63.5	17.7
	No	-23.2	-89.8	43.4	-18.1	-93.2	57.0

		Black Male Percentage Change	Black Male Lower Confidence Limit	Black Male Upper Confidence Limit	Black Female Percentage Change	Black Female Lower Confidence Limit	Black Female Upper Confidence Limit
	Overall	0.4	-25.5	26.3	-16.5	-37.3	4.3
Age	18-34	11.0	-24.1	46.1	5.2	-25.6	36.0
	35-54	-6.7	-49.2	35.8	-38.5	-70.6	-6.4
	55+	-12.3	-68.6	44.0	-26.7	-70.2	16.8
Education	<High School	15.7	-38.6	70.0	3.2	-39.1	45.5
	High School	2.1	-34.2	38.4	-18.7	-45.9	8.5
	>High School	-8.5	-54.8	37.8	-24.3	-65.1	16.5
Location	St. Louis	6.1	-29.4	41.6	-13.7	-41.7	14.3
	Kansas City	-8.9	-47.3	29.5	-20.3	-52.1	11.5
	Bootheel	-19.4	-99.0	60.2	-27.8	-100.0	53.7
Health Care Coverage	Yes	6.5	-26.8	39.8	-21.4	-44.5	1.7
	No	-20.6	-55.3	14.1	2.0	-39.2	43.2

Table 5 (continued): 1990-1996 Percent Changes with Confidence Intervals for Unmonitored Cholesterol

		All Male Percent Change	All Male Lower Confidence Limit	All Male Upper Confidence Limit	All Female Percent Change	All Female Lower Confidence Limit	All Female Upper Confidence Limit	All Percent Change	All Lower Confidence Limit	All Upper Confidence Limit
	Overall	-17.5	-39.3	4.3	-13.4	-35.0	8.2	-15.3	-31.4	0.8
Age	18-34	-2.9	-39.7	33.9	-3.7	-37.0	29.6	-3.3	-28.6	22.0
	35-54	-36.8	-67.0	-6.6	-33.3	-71.1	4.5	-35.5	-60.0	-11.0
	55+	-17.1	-81.0	46.8	-14.0	-60.6	32.6	-15.0	-51.1	21.1
Education	<High School	-12.3	-61.5	36.9	-8.2	-58.8	42.4	-10.4	-47.8	27.0
	High School	-16.5	-55.3	22.3	-0.5	-45.6	44.6	-10.1	-40.7	20.5
	>High School	-9.6	-53.5	34.3	-25.4	-62.6	11.8	-16.5	-43.9	10.9
Location	St. Louis	19.5	-19.7	58.7	-8.6	-41.5	24.3	4.6	-21.1	30.3
	Kansas City	-42.2	-68.7	-15.7	-19.3	-53.6	15.0	-32.4	-54.4	-10.4
	Bootheel	-11.4	-45.3	22.5	-14.7	-51.2	21.8	-13.5	-39.0	12.0
Health Care Coverage	Yes	-18.5	-44.4	7.4	-13.9	-39.8	12.0	-16.5	-34.7	1.7
	No	-19.7	-60.7	21.3	-9.8	-55.5	35.9	-14.9	-46.3	16.5

APPENDIX C
MISSOURI CARDIOVASCULAR HEALTH PROGRAM

Cardiovascular diseases cause 43% of the deaths in Missouri. The Missouri Cardiovascular Health Program has two programs to impact the burden of these diseases.

Since 1996, the Missouri Cardiovascular Health Program has addressed the disparities and health care needs among ethnic minorities, elderly, youth, low socioeconomic groups and underserved high-risk populations in the City of St. Louis, Kansas City and southeast Missouri. By utilizing strategies that emphasize education and awareness, programs on cardiovascular disease, nutrition, stroke and community empowerment focus on modifying behaviors that will impact the overall mortality rate inflicted by cardiovascular diseases.

More recently, a statewide focus has been developed to examine the environmental and policy issues surrounding cardiovascular disease risk factors, particularly lack of exercise and a diet high in fat and/or low in fiber. All across Missouri, local councils will have the responsibility of assessing their communities for available resources for physical activity and other health issues, and planning, developing, implementing, and evaluating interventions to address the identified issues.

Additional information may be obtained by contacting the Bureau of Chronic Disease Control.

CONTACT:

Diana Hawkins, M.Ed., C.H.E.S.
Program Manager
(573) 876-3207 or (800) 316-0935

— Notes —

APPENDIX D
CARDIOVASCULAR DISEASE FACTS

Estimates and General Information on Cardiovascular Disease
What is Cardiovascular Disease?

Cardiovascular diseases include ischemic heart disease and cerebrovascular disease. Ischemic heart disease, also called coronary artery disease and coronary heart disease, is a variety of ailments caused by narrowing of the coronary arteries and, therefore, a decreased blood supply to the heart. Cerebrovascular disease affects the blood vessels in the brain and may result in a blood clot forming in a vessel, a rupture of the blood vessel wall or a piece of clot or other material obstructing a cerebral vessel. A variety of risk factors influence the development of cardiovascular diseases. Age, gender and ethnicity are three factors which cannot be modified. Other risk factors include cholesterol level, hypertension, obesity, diabetes, nutrition, physical activity and tobacco usage. These risk factors can all be modified by lifestyle choices and/or medical control.

Impact

- In 1996, 53,766 Missourians died. Of these, 34% died from ischemic heart disease, making heart disease the number one cause of death in Missouri.
- Five chronic diseases accounted for nearly 70% of all deaths in Missouri in 1996. Three of these were heart disease, diabetes and stroke.
- In Missouri, heart disease is the leading cause of death among both African Americans and whites.
- More than half of all deaths from cardiovascular disease each year occur among women.
- Stroke, also known as cerebrovascular disease, was the third leading cause of death among both African Americans and whites in 1996.
- In 1996, diabetes was the sixth leading cause of death for African Americans and the seventh leading cause of death for whites.
- The prevalence of diabetes among African Americans is about 70% higher than among whites in Missouri.
- Physical inactivity is more prevalent among African Americans and Hispanics than among whites in Missouri.

Reducing the Risks

- Smoking cessation is the single most important lifestyle choice for reducing the risk of cardiovascular diseases.

- Maintaining appropriate weight can reduce the risk of developing both diabetes and hypertension.

- Controlling cholesterol levels through diet modification, medication and physical activity will greatly reduce the risk of further development of heart disease.

- Regular physical activity, such as walking, can diminish the risk of hypertension, diabetes, obesity and high blood cholesterol.

The Missouri Cardiovascular Health Program
promotes optimal quality of life for all Missourians at risk for cardiovascular diseases through prevention, education and early intervention.

For assistance call the
Bureau of Chronic Disease Control
(573) 876-3207 or (800) 316-0935

Missouri Department of Health

Division of Chronic Disease Prevention
and Health Promotion

Office of Surveillance, Research and Evaluation

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Division of Chronic Disease Prevention and Health Promotion,
101 Park DeVille Drive, Suite A
Columbia, MO 65203;
(573) 876-3200

Hearing impaired citizens telephone 1-800-735-2966

EEO/AAP services provided on a non-discrimanatory basis